

Taxonomic novelties in the *Solanum ferocissimum* group (Solanaceae: *Solanum* subg. *Leptostemonum*) from New Guinea

A.R. Bean

Summary

Bean, A.R. (2016). Taxonomic novelties in the *Solanum ferocissimum* group (Solanaceae: *Solanum* subg. *Leptostemonum*) from New Guinea, *Austrobaileya* 9(4): 560–599. Eleven *Solanum* species from the *Solanum ferocissimum* group are newly described for New Guinea: *S. arachnoides* A.R.Bean, *S. banzicum* A.R.Bean, *S. exemptum* A.R.Bean, *S. invictum* A.R.Bean, *S. malignum* A.R.Bean, *S. oomsis* A.R.Bean, *S. ortivum* A.R.Bean, *S. petilum* A.R.Bean, *S. phoberum* A.R.Bean, *S. pluriflorum* A.R.Bean and *S. scolophyllum* A.R.Bean. Five existing species are recircumscribed and newly described: *S. anfractum* Symon, *S. expedunculatum* Symon, *S. papuanum* Symon, *S. rivicola* Symon and *S. trichostylum* Merr. & L.M.Perry. *Solanum discolor* R.Br. and *S. fervens* A.R.Bean are newly recorded for New Guinea. Maps of the distribution of all these species based on herbarium specimens are provided, and the newly described species are illustrated. *S. turraeifolium* S.Moore and *S. yirrkalense* Symon are newly placed in synonymy with *S. discolor*. *S. galactites* A.R.Bean is a new name for *S. heteracanthum* Merr. & L.M.Perry. A key is provided to the 30 New Guinea species of the *Solanum ferocissimum* group.

Key Words: Solanaceae, *Solanum*, *Solanum* subg. *Leptostemonum*, *Solanum anfractum*, *Solanum arachnoides*, *Solanum banzicum*, *Solanum discolor*, *Solanum exemptum*, *Solanum expedunculatum*, *Solanum ferocissimum*, *Solanum fervens*, *Solanum galactites*, *Solanum invictum*, *Solanum malignum*, *Solanum oomsis*, *Solanum ortivum*, *Solanum papuanum*, *Solanum petilum*, *Solanum phoberum*, *Solanum pluriflorum*, *Solanum rivicola*, *Solanum scolophyllum*, *Solanum trichostylum*, new species, New Guinea flora, taxonomy, identification key, distribution maps

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Introduction

The island of New Guinea is one of the megadiverse areas of the world (Mittermeier *et al.* 1998), and includes one of the five global centres of plant diversity (Barthlott *et al.* 2007). Womersley (1978) stated that the flora of Papuasia “can be conservatively estimated as being in excess of 20000 species” of flowering plants. *Solanum* L. is one of many genera that are very well represented in New Guinea.

The taxonomic study of *Solanum* in New Guinea started only relatively recently. Scheffer (1876) described the first *Solanum* species with a New Guinea type (*Solanum incanum* Scheff.), from a collection made at Andai in West Papua, in September 1871 by Johannes Teijsmann.

German botanists described several species before and after 1900, starting with Warburg (1891), and ending with the great solanologist Georg Bitter (Bitter 1917). The types of these, held at B, were subsequently destroyed during WWII. Duplicates of some type collections from Africa have been found (Vorontsova & Knapp 2010), but Symon (1985) listed ten New Guinea species names for which no type has been located.

Nine *Solanum* species were described by Merrill & Perry (1949) from New Guinea, all based on the collections of L.J. Brass. Four of these species are now classified under the genus *Lycianthes* Bitter.

Symon (1985) reviewed the entire genus for the island of New Guinea, including the species now included under *Lycianthes*. He described 19 new species, some of which he himself collected during two trips in 1977 and 1984.

Takeuchi (2001) described *Solanum symonianum* W.N.Takeuchi, from a collection that he made in the Morobe province of Papua New Guinea.

In a recent molecular study, Aubriot *et al.* (2016) included data from numerous New Guinea species, which produced some surprising clades that seem to contradict morphological groupings. This is especially so for the *Solanum papuanum* – *S. trichostylum* – *S. expedunculatum* group. Symon (1985) considered that these three “form a trio of closely related species”, a view with which I concur. However, in the study of Aubriot *et al.* (2016), *S. papuanum* Symon and *S. trichostylum* Merr. & L.M.Perry are widely separated within the Sahul-Pacific clade, and *S. expedunculatum* Symon is far removed in a separate clade grouped with species that show no significant morphological affinity to it.

Because of this and other anomalies, I have preferred to define the *Solanum ferocissimum* group on morphological grounds, as defined by Whalen (1984) and corresponding to *S. sect. Graciliflora* used by Symon (1985). The *Solanum ferocissimum* group (*sensu* Whalen 1984) is characterised by the presence of stellate hairs, the presence of prickles (rarely absent), the cymose and often unbranched inflorescences, the usually deeply lobed ‘stellate’ corolla and the fleshy fruits that are (in most species) red at maturity. The group is distributed in Australia, New Guinea and Indonesia (Whalen 1984; Symon 1985).

From my examination of herbarium material belonging to this group, it became obvious that additional taxa are present in New Guinea. Some specimens grouped by Symon (1985) under one species name are markedly heterogeneous, and these have proved amenable to aggregation into smaller groups, forming more uniform and more readily diagnosable taxa.

Materials and methods

This account is based on a morphological examination of herbarium specimens from A, AD, BRI and CANB, 18 images of herbarium specimens held at NY (NYBG 2016), and 109 images of herbarium specimens held at L

(Bioportal 2016). Images of type specimens from B, BM, F, K, MO and US have also been studied. All measurements were taken from dried herbarium material. Distribution maps were compiled using DIVA-GIS Version 7.5.0, from localities or geocodes given on the labels of specimens from the herbaria listed above.

Single gatherings that do not match existing taxa have been formally named only when there is good fertile material, and four or more characters separate it from its perceived nearest relative. There remain numerous other single gatherings from the *Solanum ferocissimum* group that do not readily align with any named species; these potential new taxa should await further collections. As a result of the new species described herein, the circumscriptions of *S. anfractum*, *S. expedunculatum*, *S. papuanum*, *S. rivicola* Symon and *S. trichostachyum* have been amended. Hence these species are redescribed in this paper. Species for which the circumscription is unchanged from Symon (1985) have not been described, although all 30 New Guinean species of the *S. ferocissimum* group are included in a dichotomous identification key. Species treatments are arranged in alphabetical order.

Notes on characters used

The density of the stellate hairs has been classified into five categories: very sparse (stellate hairs more than 2 diameters apart, centre to centre); sparse (stellate hairs between 1 and 2 diameters apart, centre to centre); moderately dense (stellate hairs between 0.5 and 1 diameters apart, centre to centre), and hence adjacent hairs overlapping; dense (stellate hairs between 0.1 and 0.5 diameters apart, centre to centre); and very dense (stellate hairs so numerous that the surface of the leaf is obscured at 40× magnification). The width of the prickles (used only in determining the length/width ratio) is measured at the very base of the prickle, when the base is easily seen; otherwise it is the point where the prickle surface is at 45 degrees to the leaf or branchlet surface. The common peduncle length is the distance from the subtending branchlet to the insertion of the lowermost

pedicel. The rachis length is the distance from the subtending branchlet to the insertion of the uppermost pedicel. Other terminology is detailed in Bean (2004).

Taxonomy

Key to the New Guinea species of the *Solanum ferocissimum* group

- 1 Branchlets with many simple multicellular glandular hairs 1–2 mm long (stellate hairs present or absent) 2
1. Branchlets without simple multicellular glandular hairs 4
- 2 Stellate hairs present on young vegetative growth 27. *S. saruwagedense*
2. Stellate hairs absent from vegetative parts of plant. 3
- 3 Flowering pedicel to 12 mm long; fruiting pedicel to 25 mm long 14. *S. infuscatum*
3. Flowering pedicel 25–40 mm long; fruiting pedicel 60–80 mm long . . . 18. *S. missimense*
- 4 Lower surface of fully expanded leaves glabrous, or with very sparse to sparse stellate hairs (hairs not overlapping) 5
4. Lower surface of fully expanded leaves with moderately dense (hairs overlapping) to very dense stellate hairs 16
- 5 Prickles absent from branchlets and leaves. 6
5. Prickles present on branchlets, and sometimes leaves 7
- 6 Stellate hairs on lower leaf surface 0.5–0.7 (–1) mm diameter, with 4–8 filamentous lateral rays 29. *S. symonianum*
6. Stellate hairs on lower leaf surface 0.2–0.4 mm diameter, lateral rays 6–8, short and thick 2. *S. anfractum*
- 7 Branchlet prickles needle-like, 8–16 times longer than wide. 8
7. Branchlet prickles broad-based, 1–4 times longer than wide 9
- 8 Fruits elliptic with a rostrate apex; leaf prickles absent or on midvein only 16. *S. leptacanthum*
8. Fruits globose with obtuse apex; leaf prickles on midvein and lateral veins. 13. *S. gibbsiae*
- 9 Inflorescence rachis 30–65 mm long 10
9. Inflorescence rachis 0–12 mm long. 11
- 10 Fruiting pedicels 11–15 mm long; lower surface of leaf sparsely stellate-hairy 21. *S. ortivum*
10. Fruiting pedicels 27–35 mm long; lower surface of leaf glabrous . . . 6. *S. dallmannianum*
- 11 Glandular hairs (c. 0.1 mm long) present on vegetative growing tips . . . 1. *S. abortivum*
11. Glandular hairs absent 12
- 12 Stellate hairs very sparse or absent from upper leaf surface 13
12. Stellate hairs sparse to moderate density on upper leaf surface . . . 15
- 13 Branchlet prickles strongly recurved; habit sprawling and vine-like . . . 26. *S. rivicola*
13. Branchlet prickles straight; habit erect and shrubby 14

- 14 Branchlet prickles broad, 1–2 times longer than broad; leaves 2.3–3.4 times longer than broad; style 5.5–6 mm long **2. *S. anfractum***
14. Branchlet prickles narrower, 2–3 times longer than broad; leaves 1.6–2.1 times longer than broad; style 8–8.5 mm long **24. *S. phoberum***
- 15 Branchlet stellate hairs with swollen conical stalks; branchlet prickles 4–9 mm long **17. *S. malignum***
15. Branchlet stellate hairs sessile or with cylindrical stalks; branchlet prickles 2–4 mm long **28. *S. scolophyllum***
- 16 Upper surface of leaves glabrous, or with scattered stellate hairs along major veins **17**
16. Stellate hairs distributed throughout upper surface of leaf, very sparse to dense **21**
- 17 Prickles 3–70 on upper leaf surface. **18**
17. Prickles absent from upper leaf surface **19**
- 18 Branchlet prickles recurved; stellate hairs on leaves 0.15–0.25 mm diameter, white **12. *S. galactites***
18. Branchlet prickles straight; stellate hairs on leaves 0.25–0.5 mm diameter, yellow to tan **15. *S. invictum***
- 19 Leaves 14–20 cm long; mature fruits c. 8 mm diameter; seeds 2.2–2.6 mm long; inflorescences frequently 2-branched **20. *S. oomsis***
19. Leaves 7–14 cm long; mature fruits 9–16 mm diameter; seeds 2.6–3.9 mm long; inflorescences always unbranched **20**
- 20 Stellate hairs with central ray 3–6 times longer than lateral rays **11. *S. fervens***
20. Stellate hairs with central ray 0.1–0.5 times longer than lateral rays **8. *S. discolor***
- 21 Lower side of fully expanded leaves very densely stellate hairy, obscuring leaf surface even at 40× magnification **22**
21. Lower side of fully expanded leaves moderately to densely stellate hairy, the leaf surface visible at 40× magnification **26**
- 22 Stellate hairs of the upper leaf surface with 2–8 ascending lateral rays, some or all with thick stalks, and usually interspersed with some simple (unbranched) hairs **22. *S. papuanum***
22. Stellate hairs of upper leaf surface sessile or with slender stalks, lateral rays porrect, simple hairs absent **23**
- 23 Leaves with conspicuous acute lobes **5. *S. borgmannii***
23. Leaves entire or with obscure obtuse lobes. **24**
- 24 Branchlet prickles 4–8 times longer than broad; many stellate hairs on lower leaf surface with 9–14 lateral rays **23. *S. petilum***
24. Branchlet prickles 1–3.5 times longer than broad; all stellate hairs on lower leaf surface with 7–8 lateral rays **25**
- 25 Branchlet prickles 1.5–6 mm long; prickles on upper leaf surface (3–)5–70; stellate hairs very sparse to sparse on upper leaf surface **15. *S. invictum***
25. Branchlet prickles 0.5–2.5 mm long; prickles on upper leaf surface absent or 1–3 on midrib; stellate hairs moderately dense on upper leaf surface **3. *S. arachnoides***

- 26 Stems with abundant needle-like prickles (400–500/dm) **7. *S. denseaculeatum***
 26. Stems with sparser broad-based prickles (<80/dm) or stems unarmed. **27**
 27 Most flowering or fruiting calyces bearing one or more prickles **28**
 27. Calyx lacking prickles on all flowers or fruits **30**
 28 Branchlet prickles recurved; rachis of inflorescence elongate, 15–22 mm long **9. *S. exemptum***
 28. Branchlet prickles straight; rachis of inflorescence 1–4(–10) mm long **29**
 29 Larger leaves 2–3.5 cm long; flowers 4-merous; all stellate hairs on leaves with broad conical base; inflorescence 1–2 flowered. **4. *S. banzicum***
 29. Larger leaves 4–8 cm long; flowers 5-merous; few or no stellate hairs on leaves with broad conical base; inflorescence 2–5 flowered **10. *S. expedunculatum***
 30 Prickles 5–34 on upper leaf surface; prickles 4–23 on lower leaf surface. **28. *S. scolophyllum***
 30. Prickles 0–6 on upper leaf surface; prickles 0–4 on lower leaf surface **31**
 31 Stellate hairs on leaves 0.6–0.9 mm diameter; pedicels with glandular hairs **19. *S. nolense***
 31. Stellate hairs on leaves 0.2–0.5 mm diameter; pedicels without glandular hairs **32**
 32 Inflorescences branched; flowers 4-merous; petioles 7–14% length of lamina; branchlet prickles 50–13 per dm. **25. *S. pluriflorum***
 32. Inflorescences unbranched; flowers 5-merous; petioles 16–26% length of lamina; branchlet prickles 16–38 per dm. **30. *S. trichostylum***

Enumeration of species

1. *Solanum abortivum* Symon, *J. Adelaide Bot. Gard.* 8: 93 (1985). **Type:** Papua New Guinea. MOROBE PROVINCE: Middle slopes of Mt Missim, 2 June 1984, *D. Symon 13840 & A. Kairo* (holo: AD; iso: CANB; LAE *n.v.*).

For a description and discussion, see Symon (1985).

2. *Solanum anfractum* Symon, *J. Adelaide Bot. Gard.* 8: 93 (1985). **Type:** Papua New Guinea. CENTRAL PROVINCE: Trail ENE of Efogi village, 13 September 1970, *A. Kanis 1416* (holo: CANB; iso: BRI, L).

Erect perennial shrub, 0.6–4.5 m high. Sympodia bifoliate, geminate. Branchlets brown; prickles 0–30 per dm, straight, broad-based, 0.5–4 mm long, 1–2 times longer than wide, glabrous; branchlet stellate hairs absent, scattered or frequent, 0.3–0.6 mm diameter, stalks absent; lateral rays 5–8, porrect; central ray 0.1–0.3 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves elliptical, entire, 4.6–11.5 cm long, 2–3.4 cm wide, 2.3–3.4 times longer than

broad; apex acute to acuminate, base cuneate, oblique part 0–2.5 mm long, obliqueness index 0–2 percent; petioles 0.6–1.9 cm long, 11–19% length of lamina, prickles absent. Upper leaf surface dark green; prickles absent or present on midvein only or on midvein and lateral veins, 0–9, straight, broad-based, 1–9 mm long; stellate hairs confined to major veins or distributed throughout, hairs absent to sparsely distributed, 0.5–10 mm apart, 0.25–0.4 mm across, sessile, lateral rays 7–8, porrect; central ray 0.4–0.6 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface green; prickles absent or present or on midvein only or on midvein and lateral veins, 0–10; stellate hairs absent or very sparse to sparse, 0.5–10 mm apart, 0.2–0.4 mm diameter, stalks absent; lateral rays 6–8, porrect; central ray 0.3–0.5 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence leaf-opposed or supra-axillary, unbranched; common peduncle 0–6 mm long; rachis 1–12 mm long, prickles absent or occasionally present; 1–3-flowered, with all flowers bisexual, (4–)5-merous; pedicels at anthesis 15–29 mm long, 0.4–0.5 mm thick,

same thickness throughout, prickles absent. Calyx tube at anthesis 1.5–2 mm long; calyx lobes at anthesis deltate to attenuate, 1–5.5 mm long; calyx prickles absent; calyx stellae sparse to moderately dense, white, 0.2–0.5 mm across, stalks absent, lateral rays 4–8, central ray 0.5–1.5 times as long as laterals, not gland-tipped, simple hairs absent. Corolla violet to bluish, 9–13 mm long, shallowly to deeply lobed, inner surface glabrous or with sparse stellate hairs; anthers 4.9–5.3 mm long; filaments 1.2–1.5 mm long; ovary glabrous or with dense stellate hairs; functional style 5.5–6 mm long, protruding between anthers, glabrous or with scattered stellate hairs. Fruiting calyx lobes less than or more than half length of mature fruit, prickles absent; mature fruits 1–2 per inflorescence, globose, 10–12 mm diameter, red at maturity; pedicels 27–32 mm long, cylindrical or thicker towards apex, c. 0.4 mm thick at midpoint. Seeds pale yellow, 5.3–5.9 mm long, with broad annular wing.

Additional specimens examined: Papua New Guinea. MOROBE PROVINCE: Spreader Divide, between Aseki and Menyama, Nov 1970, *Streimann & Kairo* NGF42460 (BRI); Aseki, slope of Angabena ridge, Jan 1972, *Streimann & Stevens* LAE53987 (BRI); Mt Missim, Kuper Range, Wau, Aug 1985, *Wada et al.* 93 (BRI). WESTERN HIGHLANDS PROVINCE: Ridge community near Camp 1, Mt Oibo, Bismarck Range, Oct 1995, *Takeuchi* 10530 (AD, L, NY). SOUTHERN HIGHLANDS PROVINCE: Between Nol and Mendi, 24 km from Mendi, Jun 1977, *Symon* 10689 & *Katik* (AD); *ibid.*, Jun 1977, *Symon* 10692 & *Katik* (AD); Vicinity of the Hides 3 natural gas well-head, Apr 2005, *Takeuchi et al.* 19014 (CANB, L). EASTERN HIGHLANDS PROVINCE: Marafunga, c. 20 miles [32 km] NW of Goroka, Oct 1964, *Hartley* 13214 (CANB); Kassam Pass, Kainantu subdistrict, Jan 1968, *Henty & Coode* NGF29195 (BRI); Crater Mt Wildlife Management area, Abegarama, ridge above Beavetai airstrip, Aug 1998, *Takeuchi* 12912 (CANB, L); Aiyura, Jul 1954, *Womersley* 6014 (BRI). MADANG PROVINCE: Kaironk Valley, Schrader Range, Dec 1999, *Gardner* 9965 (AD). NORTHERN PROVINCE: E side, Lake Myola 1, subdistrict Kokoda, Jul 1974, *Croft et al.* LAE65003 (BRI). CENTRAL PROVINCE: E slope of Lake Myola No. 2, Sep 1973, *Croft & Lelean* NGF34552 (BRI); Trail ENE of Efogi village, Sep 1970, *Kanis* 1416 (BRI, CANB). MILNE BAY PROVINCE: Mt Mon, E of Bonenau village, Aug 1969, *Pullen* 8043 (A).

Distribution and habitat: As currently circumscribed, *Solanum anfractum* has a very considerable distribution from the Southern Highlands to the ranges east of

Port Moresby (**Map 1**). It grows at altitudes from 1280 to 2600 metres, in mossy montane or submontane rainforest, beech forest, or *Castanopsis* forest. Unlike many other species of the *S. ferocissimum* group, *S. anfractum* has often been collected from primary forest.

Phenology: Flowers and fruits are recorded from June to January.

Notes: There is much variation in *Solanum anfractum*. Specimens from the type locality and several other localities are completely unarmed, but those from the Southern and Western Highlands are conspicuously prickly on their leaves and branchlets. These prickly forms may constitute another taxon. The few seed-bearing specimens exhibit extraordinarily large seeds, with a broad annular wing; it is not known whether this is a constant feature for *S. anfractum*. Differences in the style and ovary indumentum and the calyx lobe shape and length may also indicate hidden taxa within *S. anfractum*.

3. *Solanum arachnoides* A.R.Bean sp. nov. With affinity to *S. papuanum* Symon, but differing by the smaller sessile stellate hairs on the lower leaf surface, the smaller stellate hairs of the upper leaf surface, the often branched inflorescence, the longer anthers, and the smaller fruits. **Typus:** Papua New Guinea. MOROBE PROVINCE. Aseki Road, near crest, 31 May 1984, *D.E. Symon* 13826 (holo: CANB [3 sheets]; iso: AD, L).

Erect perennial shrub, 0.75–3.5 m high. Sympodia bifoliate, geminate or disjunct. Branchlets brown; prickles 10–26 per dm, straight, broad-based, 1–3 mm long, 1–2.5 times longer than wide, with stellate hairs throughout lower part; branchlet stellate hairs dense to very dense, 0.25–0.35 mm diameter, stalks 0–0.05 mm long; lateral rays 7–8, porrect; central ray 0–0.1 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves ovate to elliptical, entire, 3.4–6 cm long, 1.5–3.5 cm wide, 1.7–2.8 times longer than broad; apex acute, base cuneate, oblique part 0–2 mm long, obliqueness index 0–3 percent; petioles 0.5–1.1 cm long, 15–22% length of lamina, prickles absent or rarely present. Upper leaf surface green; prickles

absent or sometimes present on midvein only, 0–3, straight, broad-based, 2–4 mm long; stellate hairs distributed throughout, sparse to moderately dense, 0.2–0.4 mm apart, 0.15–0.25 mm across, sessile, lateral rays 7–8, porrect; central ray 0–0.1 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface yellow to rusty; prickles absent; stellate hairs very dense, 0–0.05 mm apart, 0.15–0.3 mm diameter, stalks 0–0.05 mm long; lateral rays 7–8, porrect; central ray 0–0.1 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-axillary, unbranched or 2-branched or 3-branched; common peduncle 0–3 mm long; rachis 0–21 mm long, prickles absent or occasionally present near base; 7–17-flowered, with all flowers bisexual, 5-merous; pedicels at anthesis 8–9 mm long, 0.5–0.7 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis 1–2 mm long; calyx lobes at anthesis elliptic, 0.5–1 mm long; calyx prickles absent; calyx stellae very dense, yellow, 0.2–0.3 mm across, stalks 0–0.1 mm long, lateral rays 7–8, central ray 0–0.1 times as long as laterals, not gland-tipped, simple hairs absent. Corolla mauve to purple, 9–12 mm long, shallowly lobed, inner surface with very sparse stellate hairs; anthers 4–4.6 mm long; filaments 1–1.9 mm long; ovary with sparse tiny glandular hairs; functional style 6.5–7.5 mm long, protruding between anthers, with sparse tiny glandular hairs towards base, otherwise glabrous. Fruiting calyx lobes less than half length of mature fruit, prickles absent; mature fruits 6–14 per inflorescence, globose, 6–7 mm diameter, dull red (*Symon 13826*) at maturity; pedicels 17–29 mm long, thicker towards apex, 0.8–0.9 mm thick at midpoint. Seeds yellow, 2.5–2.6 mm long.

Figs. 1, 2.

Additional specimens examined: Papua New Guinea. MOROBE PROVINCE: Ekuti divide, Bulolo – Aseki Road, 35 km WSW of Bulolo, Jun 1982, *Streimann 8383* (L); Aseki Road, near crest, May 1984, *Symon 13826* (AD, CANB, L); Aseki Road from Bulolo, near crest, May 1984, *Symon 13825* (AD, L, NY); Ekuti Divide on Bulolo – Aseki Road, Feb 1993, *Takeuchi 8831* (AD, BRI).

Distribution and habitat: *Solanum arachnoides* is known only from the Bulolo – Aseki road, in the Morobe province (**Map 3**), at altitudes between 2100 and 2200 metres.

It grows on roadsides adjacent to montane forest.

Phenology: Flowers and fruits have been recorded for February, May and June.

Notes: *Solanum arachnoides* is morphologically most similar to *S. papuanum*, but differs by the sessile stellate hairs on the lower leaf surface, 0.15–0.3 mm diameter (long stalked, 0.45–0.6 mm diameter for *S. papuanum*); simple hairs absent (present for *S. papuanum*); porrect stellae on upper leaf surface, 0.15–0.25 mm across (ascending stellate hairs 0.3–0.8 mm diameter for *S. papuanum*).

Aubriot *et al.* (2016) have attributed *Symon 13826*, with its moderately long rachis, to *S. trichostylum*, and it forms their sole voucher for *S. trichostylum*. *Streimann 8383*, which has a very short rachis, has been attributed to *S. expedunculatum*, and it forms one of two vouchers they used for *S. expedunculatum*. Both specimens are included here under *S. arachnoides*.

Etymology: The specific epithet is from the Greek *arachne* (spider), and *-oides* (resembling). The usually 8-rayed hairs of the upper leaf surface resemble a horde of tiny spiders.

4. *Solanum banzicum* A.R.Bean sp. nov. With affinity to *S. expedunculatum* Symon, but differing by the 4-merous flowers, the 1–2-flowered inflorescences, the smaller leaves with very short petioles, and by the broad conical base possessed by all stellate hairs on the leaves and branchlets. **Typus:** Papua New Guinea. WESTERN HIGHLANDS PROVINCE. Waghi – Sepik divide, 9 km N of Banz, 7 July 1982, *H. Streimann 8467* (holo: BRI; iso: L; LAE n.v.).

Erect or sprawling perennial shrub to 1 m high. Sympodia bifoliate, geminate or disjunct. Branchlets brown; prickles 13–29 per dm, straight, broad-based, 1.5–4 mm long, 1–2 times longer than wide, with scattered stellate hairs on lower part; branchlet stellate hairs frequent to dense, 0.5–1 mm diameter, stalks 0.1–0.5 mm long, broad, conical; lateral rays 4–8, porrect; central ray 0.6–1.2 times as long



Fig. 1. Holotype of *Solanum arachnoides* (Symon 13826, CANB).

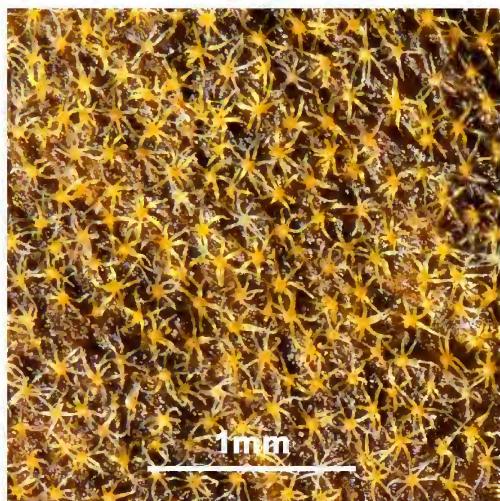


Fig. 2. Stellate hairs on upper leaf surface of *Solanum arachnoides* (Symon 13826, CANB).

as laterals, often deflexed, not gland-tipped; simple hairs absent. Adult leaves broadly ovate, entire, 2.2–3.6 cm long, 1.2–1.9 cm wide, 1.3–1.9 times longer than broad; apex acute to acuminate, base cuneate or obtuse, oblique part 0–2 mm long, obliqueness index 0–9 percent; petioles 0.3–0.5 cm long, 14–22% length of lamina, prickles present. Upper leaf surface green; prickles present on midvein and lateral veins or on midrib only, 2–10, straight, broad-based, 2.5–5 mm long; stellate hairs distributed throughout, dense, 0.2–0.4 mm apart, 0.4–1 mm across, stalks 0.1–0.3 mm long, broad, conical; lateral rays 1–6, ascending; central ray 1–1.5 times as long as laterals, not gland-tipped; simple hairs often present, 0.5–2 mm apart, 0.2–0.7 mm long. Lower leaf surface rusty; prickles 1–4 along midvein and lateral veins or on midvein only; stellate hairs dense, 0.25–0.5 mm apart, 0.5–1 mm diameter, stalks 0.1–0.6 mm long; lateral rays 4–8, porrect or ascending; central ray 1–1.5 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-axillary, unbranched; common peduncle 0–1 mm long; rachis 1–3 mm long, prickles absent or present; 1 or 2-flowered, with all flowers bisexual, 4-merous; pedicels at anthesis 8–21 mm long, 0.5–0.7 mm thick, same thickness throughout, prickles present

or absent. Calyx tube at anthesis 1.5–2.5 mm long; calyx lobes at anthesis rostrate, 3.5–6 mm long; calyx prickles usually present, 0–5, 1–2 mm long; calyx stellae moderately dense to dense, rusty, 0.5–0.7 mm across, stalks 0.1–0.25 mm long, lateral rays 4–8, central ray 1–1.5 times as long as laterals, not gland-tipped, simple hairs absent. Corolla white, 11–12 mm long, shallowly to deeply lobed, inner surface with very sparse stellate hairs along lobe midveins; anthers 4.8–5.3 mm long; filaments 1.2–1.8 mm long; ovary glabrous or with a few tiny glandular hairs; functional style 7.5–8 mm long, protruding between anthers, with sparse tiny glandular hairs towards base and sometimes a few stellate hairs, otherwise glabrous. Fruiting calyx lobes less than or more than half length of mature fruit, prickles often present; mature fruits 1–2 per inflorescence, globose, mature fruits not seen; pedicels of immature fruits 20–28 mm long, same thickness throughout, 0.5–0.7 mm thick at midpoint. **Figs. 3, 4.**

Additional specimens examined: Papua New Guinea. WESTERN HIGHLANDS PROVINCE: Waghi – Sepik divide, 9 km N of Banz, Jul 1982, *Streimann 8467* (BRI, L); *ibid.*, Jul 1982, *Streimann 8473* (BRI, L); On the Waghi – Sepik divide, about the crest, 17 km from Banz and c. 45 km from Tabibuga, Jun 1977, *Symon 10702* (AD, L); On the Waghi – Sepik divide between Banz and Tabibuga near the crest of the divide c. 20 km from Banz, Jun 1977, *Symon 10706* (AD).

Distribution and habitat: *Solanum banzicum* is known only from a small area of the Western Highlands (**Map 3**) at altitudes between 2200 and 2400 metres. Its recorded habitats are “regrowth on ridge” and “roadside spill”.

Phenology: Flowers and immature fruits are recorded for June and July.

Notes: The specimens of *Solanum banzicum* cited above were included by Symon (1985) in *S. expedunculatum*. *S. banzicum* is closely related to *S. expedunculatum*, but differs by the 4-merous flowers, the 1–2-flowered inflorescences, the smaller leaves with very short petioles, and all stellate hairs on the leaves and branchlets having broad conical bases. The type locality of *S. banzicum* is more than 70 km from the nearest known population of *S. expedunculatum*.

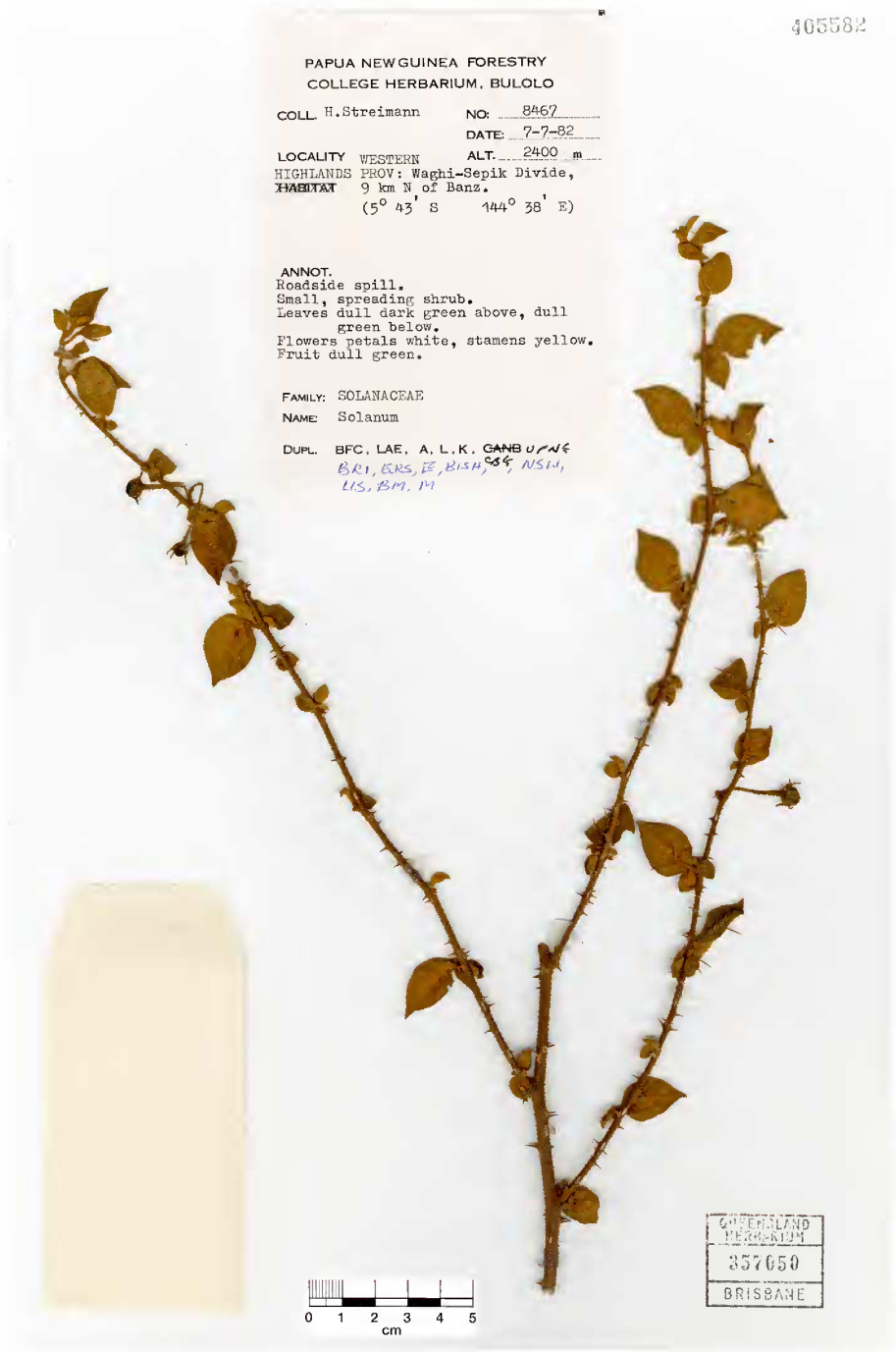


Fig. 3. Holotype of *Solanum banzicum* (Streimann 8467, BRI).

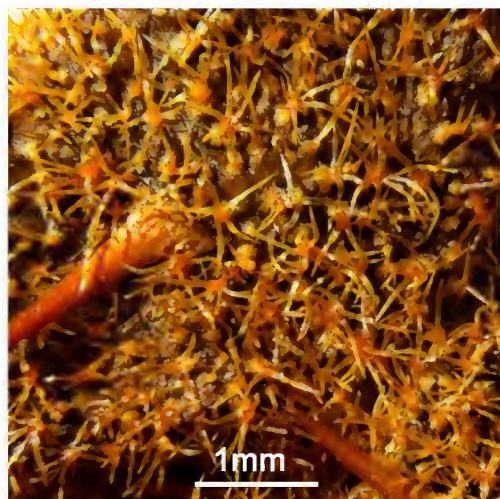


Fig. 4. Stellate hairs on upper leaf surface of *Solanum banzicum* (Streimann 8467, BRI).

Etymology: The specific epithet refers to the village of Banz, near where the type was collected.

5. *Solanum borgmannii* Symon, *J. Adelaide Bot. Gard.* 8: 97 (1985). **Type:** Papua New Guinea. SIMBU PROVINCE: Komanimambino, slopes of Mt Wilhelm, 29 September 1960, *E. Borgmann* 213 (holo: L; iso: LAE *n.v.*).

For a description and discussion, see Symon (1985).

6. *Solanum dallmannianum* Warb., *Bot. Jahrb. Syst.* 13: 415 (1890). **Type:** Papua New Guinea. MOROBE PROVINCE: Sattelburg, *s.dat.*, [*A.A.*] *Dallmann* *s.n.* (holo: B, destroyed).

For a description and discussion, see Symon (1985).

7. *Solanum denseaculeatum* Symon, *J. Adelaide Bot. Gard.* 8: 100 (1985). **Type:** Papua New Guinea. MOROBE PROVINCE: Golden Pines Logging Area, Watut, 20 October 1965, *H. Streimann* & *A. Kairo* NGF21198 (holo: BRI; iso: A, BRI, CANB, K, L; LAE, NSW all *n.v.*).

For a description and discussion, see Symon (1985).

8. *Solanum discolor* R.Br., *Prodr.* 445 (1810). **Type:** Queensland. COOK DISTRICT: ‘Coen river’ [Pennefather River], Carpentaria, 7 November 1802, *R. Brown* *s.n.* (lecto: BM 000596891), *fide* Symon (1981: 40).

Solanum turraeifolium S.Moore, *J. Bot.* 61, suppl. 37 (1927), as ‘turraeaeifolium’. **Type:** New Guinea. CENTRAL PROVINCE: Near Kerepunu, Sogeri district, 1885–1886, *H.O. Forbes* *s.n.* (holo: BM 000886282), **syn. nov.**

Solanum yirrkalense Symon, *J. Adelaide Bot. Gard.* 4: 137 (1981), as ‘yirrkalensis’. **Type:** Northern Territory. Yirrkala gardens, 27 February 1976, *D. Hinz* 7633 (holo: DNA [ex NT]; iso: BRI, CANB, DNA), **syn. nov.**

For a description, see Bean (2004).

Additional selected specimens examined: Papua New Guinea. CENTRAL PROVINCE: Hisiu, Feb 1935, *Carr* 11401 (CANB, L, NY); near Hisiu, Kairuku subdistrict, Aug 1962, *Pullen* 3546 (CANB); Tovobada Hills, E footslopes, 12 miles [19 km] N of Port Moresby, May 1965, *Heyligers* 1164 (CANB, L); Bioto, Aug 1918, *C.T. White* 581 (BRI).

Distribution and habitat: *Solanum discolor* is found at the extreme north-east of the Northern Territory, on the Cape York Peninsula of Queensland, north of latitude 14 degrees, and in the Central province of Papua New Guinea, close to Port Moresby (**Map 2**). All occurrences are at low altitude (<100 metres), where it occurs on the edges of lowland or littoral rainforest, on sandy soils.

Phenology: In Papua New Guinea, flowers are recorded for February and May; fruits in February, May and August.

Notes: Symon (1981) named *Solanum yirrkalense* from a single location in the Northern Territory, Australia. He stated that it differed from *S. corifolium* F.Muell. and *S. discolor* by the “broad leaves, white rather than pale blue flowers, and relatively large berries”. Bean (2004) did not consider any of these differences to be significant or consistent, but he separated *S. yirrkalense* from *S. discolor* by the sparser indumentum of the lower leaf surface and the longer common peduncles of the cymes. After consideration of New Guinea material and some additional Australian material, it has become clear that

these characters are also unreliable, with peduncle length being quite variable and the stellate hair density apparently reflecting the microhabitat and/or the stage of growth of the plant. As a consequence, *S. yirrkalense* is here reduced to synonymy under *S. discolor*. *S. turraeifolium* is also relegated to synonymy; its type is virtually identical in appearance to the lower branchlet of the lectotype of *S. discolor*, and its micro-morphological features also agree with those of *S. discolor*.

9. *Solanum exemptum* A.R.Bean sp. nov. With affinity to *S. rivicola* Symon but differing by the greater number of prickles on the lower leaf surface, the moderately dense stellate hairs of the lower leaf surface with a shorter central ray, the inflorescence 9–14 flowered with a common peduncle and elongated rachis, the thicker pedicels, the attenuate calyx lobes; and the larger shallowly-lobed corolla. **Typus:** Papua New Guinea. MILNE BAY PROVINCE: Mayu 2, Raba Raba subdistrict, 15 July 1972, *P.F. Stevens & J.F. Veldkamp LAE55565* (holo: BRI; iso: CANB, L; LAE *n.v.*).

Sprawling plant to 0.4 m high, rooting at the nodes. Sympodia bifoliate, disjunct. Branchlets brown; prickles 56–80 per dm, slightly recurved, broad-based, 1–4.5 mm long, 2–3 times longer than wide, glabrous throughout or with sparse stellate hairs attached; branchlet stellate hairs dense, 0.4–0.6 mm diameter, stalks 0–0.2 mm long; lateral rays 7–8, porrect; central ray 0–0.2 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves elliptical, entire, 3.1–4 cm long, 1.5–1.8 cm wide, 2.1–2.4 times longer than broad; apex acute to acuminate, base cuneate, oblique part 0–2 mm long, obliqueness index 0–6 percent; petioles 0.5–0.75 cm long, 13–19% length of lamina, prickles present. Upper leaf surface green; prickles present on midvein and lateral veins, 7–18, straight, broad-based, 3–7 mm long; stellate hairs distributed throughout, hairs sparse to moderately dense, 0.2–0.3 mm apart, 0.25–0.55 mm across, sessile, lateral rays 4–7, porrect; central ray 0.3–0.6 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface yellowish-

green; prickles 16–28, present on midvein and lateral veins; stellate hairs moderately dense, 0.15–0.25 mm apart, 0.25–0.5 mm diameter, stalks 0–0.05 mm long; lateral rays 4–8, porrect; central ray 0.1–0.4 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-axillary, unbranched; common peduncle present, 2–6 mm long; rachis present, 15–22 mm long; 9–14-flowered, with all flowers seemingly bisexual, 5-merous; pedicels at anthesis 7–15 mm long, 0.3–0.4 mm thick, same thickness throughout, prickles present. Calyx tube at anthesis 2–3 mm long; calyx lobes at anthesis attenuate, 2.5–3.5 mm long; calyx prickles almost always present; calyx stellae moderately dense to dense, yellow, 0.25–0.4 mm across, stalks 0–0.1 mm long, lateral rays 6–8, central ray 0.5–1 times as long as laterals, not gland-tipped, simple hairs absent. Corolla purple, c. 15 mm long, shallowly lobed, inner surface with sparse stellate hairs; anthers 6–6.2 mm long; filaments 2.3–2.5 mm long; functional style c. 8 mm long, protruding between anthers, with sparsely scattered tiny glandular hairs. Fruiting material not seen. **Figs. 5, 6.**

Additional specimens examined: Known only from the type.

Distribution and habitat: *Solanum exemptum* is known only from the Mayu River, near Mt Suckling in Milne Bay province (**Map 4**). The recorded altitude is 1760 metres. The type was located on a “bare sandy place by river”.

Phenology: Flowers are recorded for July.

Notes: The type specimen of *Solanum exemptum* was included by Symon (1985) in *S. rivicola*. It differs from *S. rivicola* by the 16–28 prickles on the lower leaf surface (5–13 prickles for *S. rivicola*), the moderately dense stellate hairs of the lower leaf surface with central ray 0.1–0.4 times as long as laterals (very sparse to sparse stellate hairs, central ray 0.5–1.6 times for *S. rivicola*), the inflorescence 9–14-flowered with a common peduncle and elongated rachis (inflorescence 1–2-flowered, both common peduncle and rachis absent for *S. rivicola*), the pedicels 0.3–0.4 mm thick at anthesis (0.15–0.25 mm thick for *S. rivicola*), the attenuate calyx lobes

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Fig. 5. Holotype of *Solanum exemptum* (Stevens & Veldkamp LAE55565, BRI).



Fig. 6. Two inflorescences of *Solanum exemptum* (Stevens & Veldkamp LAE55565, BRI).

(elliptic for *S. rivicola*); and the shallowly-lobed corolla c. 15 mm long (deeply lobed, 7–12 mm long for *S. rivicola*).

Etymology: The specific epithet is from the Latin *exemptus*, meaning ‘taken out, removed or released’. This alludes to the notion that this species was taken out of *S. rivicola*, under which it was previously included.

10. *Solanum expedunculatum* Symon, *J. Adelaide Bot. Gard.* 8: 103 (1985). **Type:** Papua New Guinea. EASTERN HIGHLANDS PROVINCE: Top of Daulo Pass, 22 June 1977, D.E. Symon & P. Katik 10675 (holo: AD; iso: AD, BRI, CANB, K; F n.v.).

Erect or sprawling perennial shrub, 0.6–3 m high. Sympodia bifoliate, disjunct. Branchlets brown or rusty; prickles 25–42 per dm, straight, broad-based, 2–4.5 mm long, 1.5–4 times longer than wide, with stellate hairs throughout lower part; branchlet stellate hairs dense, 0.6–0.9 mm diameter, stalks 0–0.25 mm long, slender, cylindrical; lateral rays

7–8, porrect or ascending; central ray 1–2.5 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves ovate to elliptical, entire, 4.3–8.1 cm long, 1.9–3.8 cm wide, 1.6–2.3 times longer than broad; apex acute to acuminate, base cuneate or obtuse, oblique part 0–1.5 mm long, obliqueness index 0–2 percent; petioles 0.6–1.9 cm long, 14–32% length of lamina, prickles present or rarely absent. Upper leaf surface green; prickles present on midvein and lateral veins, 4–43, straight, broad-based, 2–4 mm long; stellate hairs distributed throughout, dense, 0.2–0.4 mm apart, 0.3–0.8 mm across, stalks 0–0.25 mm long, slender, cylindrical; lateral rays 3–12, porrect or ascending or multiradiate; central ray 1–3 times as long as laterals, not gland-tipped; simple hairs sometimes present, 0.15–0.8 mm apart, 0.2–0.7 mm long. Lower leaf surface rusty; prickles absent or 6–20 present along midvein and lateral veins; stellate hairs dense, 0.15–0.3 mm apart, 0.5–0.8 mm diameter, stalks 0–0.2 mm long; lateral rays 7–12, porrect or multiradiate; central ray 1–3 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-axillary, unbranched; common peduncle 0–4 mm long; rachis 0–12 mm long, prickles absent or present; 2–5-flowered, with all flowers bisexual, 5-merous; pedicels at anthesis 7–25 mm long, 0.6–0.7 mm thick, same thickness throughout or broader near apex, prickles present. Calyx tube at anthesis 1.5–3 mm long; calyx lobes at anthesis rostrate, 2.5–5.5 mm long; calyx prickles present, 3–28, 1–4 mm long; calyx stellae moderately dense to dense, rusty, 0.3–0.7 mm across, stalks 0–0.1 mm long, lateral rays 7–8, central ray 1.5–3 times as long as laterals, not gland-tipped, simple hairs absent. Corolla white (occasionally tinged with purple), 13–14 mm long, shallowly lobed, inner surface with sparse stellate hairs; anthers 4.5–4.8 mm long; filaments 2.0–2.3 mm long; ovary with sparse tiny glandular hairs; functional style c. 8.3 mm long, protruding between anthers, with sparse tiny glandular hairs towards base, otherwise glabrous. Fruiting calyx lobes less than half length of mature fruit, prickles present; mature fruits 1–3 per inflorescence,

globose, 10–12 mm diameter, reddish-orange (*Vandenberg & Womersley NGF35007*) or red (*Symon & Katik 10700*; *Stevens LAE51095*) at maturity; pedicels 23–35 mm long, thicker towards apex, 0.8–0.9 mm thick at midpoint. Seeds yellow, c. 3.2 mm long.

Additional specimens examined: Papua New Guinea. EASTERN HIGHLANDS PROVINCE: Fatima River, Marafunga, subdistrict Goroka, Nov 1968, *Millar NGF40708* (BRI, L); Marafunga, extension area 1, by Fatima River, Nov 1970, *Stevens LAE51095* (BRI, L); Top of Daulo Pass, Jun 1977, *Symon & Katik 10675* (AD, BRI, L); E slope of Daulo, Jun 1977, *Symon 10680* (AD); Marafunga Logging Area, Goroka sub-district, May 1968, *Vandenberg & Womersley NGF35007* (BRI, L). SOUTHERN HIGHLANDS PROVINCE: SE slopes of Mt Giluwe, Jun 1977, *Symon & Katik 10700* (AD, L).

Distribution and habitat: *Solanum expedunculatum* is known mainly from the Marafunga and Daulo Pass area of the Eastern Highlands province, but there is also an occurrence near Mount Giluwe in the Southern Highlands (**Map 2**). Altitude varies from 2100 to 2600 metres. It grows in disturbed areas of logged forest and on roadsides.

Phenology: Flowers and fruits are recorded for May, June and November.

Notes: Symon (1985) stated that the name of this species was given because of the “virtual absence of a peduncle to the reduced inflorescences”, and it seems that his specimen determinations were greatly influenced by this characteristic. This has resulted in the grouping of a number of specimens that have numerous morphological disparities. In this account, *S. expedunculatum* is considered to be confined to a relatively small area of the Eastern and Southern Highlands.

11. *Solanum fervens* A.R.Bean, *Austrobaileya* 6: 686 (2004). **Type:** Queensland. COOK DISTRICT: Eastern bank of Jardine River mouth, 1 September 1985, *J.R. Clarkson 6219* (holo: BRI [1 sheet + spirit]; iso: AD, CNS).

Illustrations: Symon (1985: 128), as *S. turraeifolium*; Bean (2004: 687).

For a description, see Bean (2004).

Additional specimens examined: Papua New Guinea. CENTRAL PROVINCE: Tavai Creek area, c. 43 miles [69 km]

SE of Port Moresby, May 1967, *Pullen 6872* (CANB, L); Boku, Nov 1909, *Schlencker s.n.* (BRI [AQ80466]).

Distribution and habitat: *Solanum fervens* occurs in the northern part of Cape York Peninsula, Queensland, and in the Central province of Papua New Guinea, where it is known from two sites (**Map 2**). It occurs in monsoon forest on low hills, where the elevation is around 150 metres.

Phenology: Flowers are recorded for May; fruits in May and November.

Notes: The two specimens cited above were included by Symon (1985) under *Solanum turraeifolium* (= *S. discolor*). However, these specimens have a very long central ray on the stellate hairs of the leaves and branchlets, and are a very good match for specimens of *S. fervens* from Cape York Peninsula, Queensland, including the type.

12. *Solanum galactites* A.R.Bean **nom. nov.**; *Solanum heteracanthum* Merr. & L.M.Perry, *J. Arn. Arbor.* 30: 48 (1949), **nom. illeg. non** Dunal (1813).

For a description and discussion, see Symon (1985) as *S. heteracanthum*.

Note: This species requires a new name because the epithet chosen by Merrill and Perry had already been validly published by Dunal in 1813.

Etymology: The replacement epithet is from the Greek *galaktites* meaning milk-like, referring to the milky-white undersides of the leaves.

13. *Solanum gibbsiae* J.R.Drumm. in Gibbs, *Fl. Arfak Mts.* 177 (1917). **Type:** Indonesia. West Papua. Angi Lakes, Arfak Mountains, December 1913, *L.S. Gibbs 5974* (holo: BM).

For a description and discussion, see Symon (1985).

14. *Solanum infuscatum* Symon, *J. Adelaide Bot. Gard.* 8: 107 (1985). **Type:** Papua New Guinea. MOROBE PROVINCE: Arigenang village, 14 February 1970, *D.B. Foreman NGF48100* (holo: LAE n.v.; iso: BRI, CANB, L).

For a description and discussion, see Symon (1985).

15. *Solanum invictum* A.R.Bean sp. nov. With affinity to *S. trichostylum* Merr. & L.M.Perry, but differing by the longer prickles on the branchlets, the more numerous prickles on the upper leaf surface, the glabrous or very sparsely hairy upper leaf surface, the very densely hairy lower leaf surface, and the style with dense stellate hairs only at the base. **Typus:** Papua New Guinea. CENTRAL PROVINCE: SE slope to Mt Victoria Range, Port Moresby subdistrict, 7 July 1974, *J. Croft & G. Larivita LAE61684* (holo: BRI; iso: A, CANB, L; LAE *n.v.*).

Erect perennial shrub, 1–2.5 m high. Sympodia bifoliate, geminate or disjunct. Branchlets yellow to dark brown; prickles 22–70 per dm, straight or curved, broad-based, 1–6 mm long, 1.5–3.5 times longer than wide, with stellate hairs throughout lower part; branchlet stellate hairs dense to very dense, 0.3–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 0.5–1.2 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves ovate to broadly ovate, entire or repand, 6.8–12.8 cm long, 3.3–9 cm wide, 1.4–2.8 times longer than broad; apex acute to acuminate, base cuneate or obtuse, oblique part 0–5 mm long, obliqueness index 0–5 percent; petioles 1.2–3.3 cm long, 16–26% length of lamina, prickles present. Upper leaf surface dark green; prickles present on midvein and lateral veins, rarely on midvein only, (3–)5–60, straight, broad-based, 2.5–7 mm long; stellate hairs confined to major veins or distributed throughout, hairs absent or very sparsely distributed, 0.7–4 mm apart, 0.4–0.5 mm across, sessile, lateral rays 7–8, porrect; central ray 0.5–0.8 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface pale yellow to brown; prickles 1–14, present on midvein and lateral veins, or on midvein only; stellate hairs very dense, 0–0.05 mm apart, 0.3–0.45 mm diameter, stalks 0–0.1 mm long; lateral rays 7–8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence leaf-opposed or supra-axillary, unbranched or 2-branched; common peduncle 0–30 mm long; rachis 15–40 mm long, prickles absent or occasionally present; 6–15-flowered, with

all flowers bisexual, 5-merous; pedicels at anthesis 9–13 mm long, 0.65–1.1 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis 2.5–3.5 mm long; calyx lobes at anthesis deltate to rostrate, 0.5–2(–5) mm long; calyx prickles absent; calyx stellae very dense, yellow, brown or rusty, 0.3–0.4 mm across, stalks 0–0.1 mm long, lateral rays 7–8, central ray 0.7–1.3 times as long as laterals, not gland-tipped, simple hairs absent. Corolla light purple to purple, *c.* 12 mm long, shallowly lobed, inner surface with sparse to dense stellate hairs; anthers 4.1–4.7 mm long; filaments 1.3–2 mm long; ovary with dense stellate hairs; functional style 6.5–7 mm long, protruding between anthers, with dense stellate hairs on basal 1 mm, otherwise glabrous. Fruiting calyx lobes less than or more than half length of mature fruit, prickles absent; mature fruits 2–3 per inflorescence, globose, 12–18 mm diameter, yellow (*van Royen 10901*) or orange (*Ridsdale NGF36960*) at maturity; pedicels 20–30 mm long, thicker towards apex, 1.1–1.6 mm thick at midpoint. Seeds not seen. **Figs. 7, 8.**

Additional specimens examined: Papua New Guinea. CENTRAL PROVINCE: SE slope to Mt Victoria Range, Jul 1974, *Croft & Larivita LAE61684* (A, BRI, CANB); Trail to Mt Albert Edward, subdistrict Goilala, Jul 1969, *Foreman & Wardle NGF45531* (BRI, CANB, L); Murray Pass, Goilala sub-district, Aug 1968, *Ridsdale NGF36960* (A, BRI, CANB, L); Road from Waitape to Kosipi, Uriko, Jan 1965, *van Royen NGF20224* (BRI, CANB, L); Mt Victoria area, track from Koma Creek to the Rock Pile, SE of Mt Service, May 1976, *van Royen 10901* (CANB, L).

Distribution and habitat: *Solanum invictum* is confined to a relatively small area on and adjacent to the main dividing range to the north and north-east of Port Moresby (**Map 3**). It inhabits disturbed sites in or adjacent to montane rainforest at altitudes between 2000 and 3000 metres. Associated species include *Nothofagus* sp. and *Papuacedrus papuana* (F.Muell.) H.L.Li.

Phenology: Flowers and fruits have been recorded in January, May, July and August.

Notes: The specimens of *Solanum invictum* cited above were included by Symon (1985) in *S. trichostylum*. It differs from *S. trichostylum* by the branchlet prickles 1–6 mm long (1–2

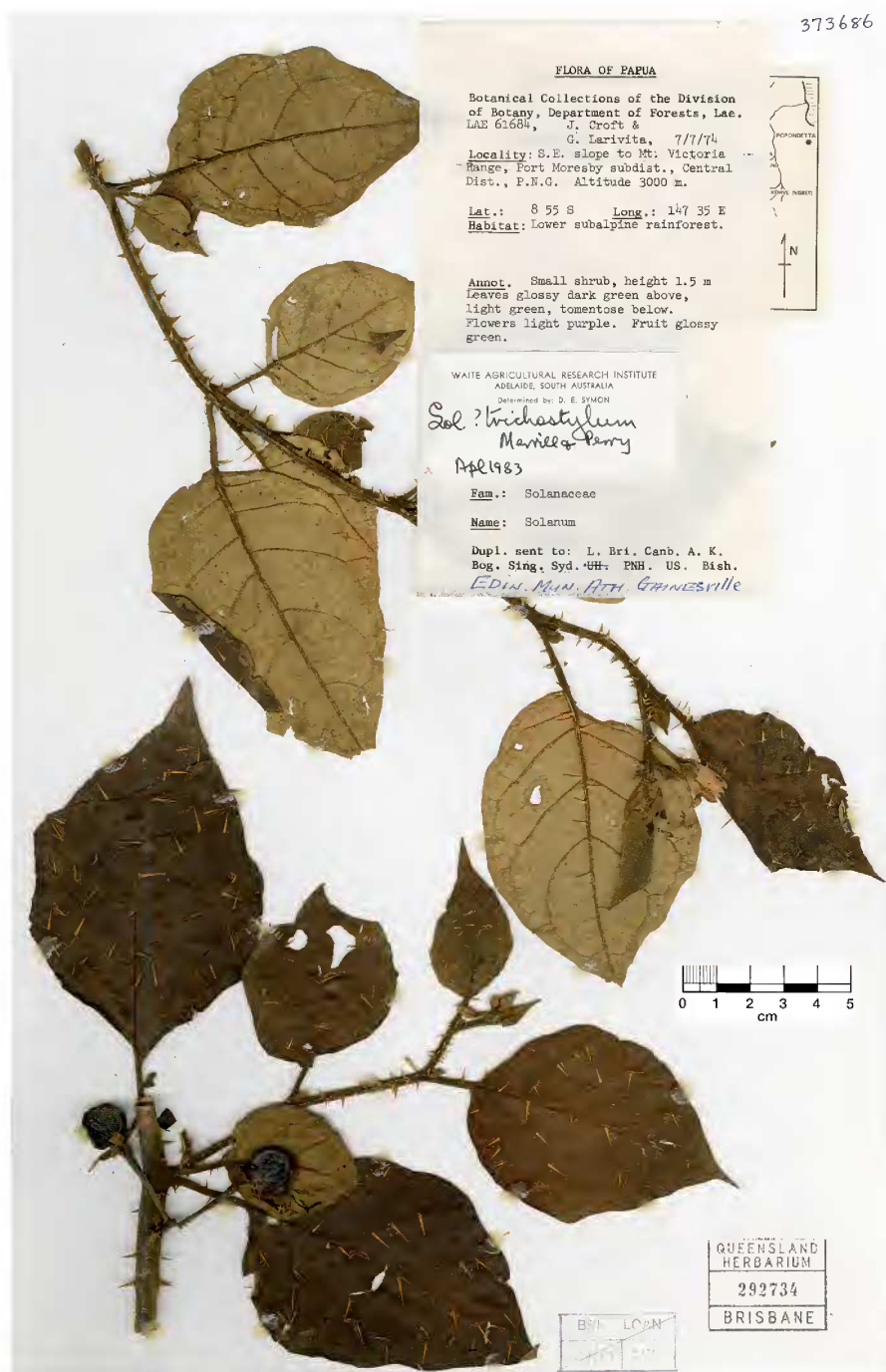


Fig. 7. Holotype of *Solanum invictum* (Croft & Larivita LAE61684, BRI).



Fig. 8. Section of branchlet of *Solanum invictum* (Croft & Larivita LAE61684, BRI).

mm long for *S. trichostylum*), the more numerous (3–60) prickles on the upper leaf surface (0–6 for *S. trichostylum*), the glabrous or very sparsely hairy upper leaf surface (sparsely hairy for *S. trichostylum*), the very densely hairy lower leaf surface (moderately dense hairs for *S. trichostylum*), and the style with dense stellate hairs only at the base (stellate hairs almost throughout or with tiny glandular hairs only for *S. trichostylum*).

Etymology: The specific epithet is from the Latin *invictus*, meaning ‘unconquered, strong’. This species has the appearance of being a strong and sturdy shrub.

16. *Solanum leptacanthum* Merr. & L.M.Perry, *J. Arnold Arb.* 30: 45 (1949). **Type:** Papua New Guinea. CENTRAL PROVINCE: Diene, Ononge road, April 1933, *L.J. Brass 3814* (holo: A; iso: BRI, L, NY).

For a description and discussion, see Symon (1985).

17. *Solanum malignum* A.R.Bean **sp. nov.** With affinity to *S. rivicola*, but differing by its erect shrubby habit; the much longer (and

invariably straight) prickles on the branchlets; the stellate hairs of the branchlets with broad conical stalks; the fewer prickles on the upper leaf surface and the 5–7-flowered inflorescences with pedicels 0.4–0.6 mm thick. **Typus:** Papua New Guinea. SOUTHERN HIGHLANDS PROVINCE: SE slopes of Mt Giluwe, IARO logging area, 26 June 1977, *D.E. Symon 10696* & *P. Katik* (holo: AD; iso: CANB, L).

Illustration: Symon (1985: 121), as *S. rivicola*.

Erect shrub 0.5–1 m high. Sympodia bifoliate, disjunct. Branchlets dark brown; prickles 14–28 per dm, straight, broad-based, 5–12 mm long, 1.5–4 times longer than wide, glabrous throughout or with sparse stellate hairs attached; branchlet stellate hairs frequent to dense, 0.4–0.65 mm diameter, stalks broad, conical, 0–0.6 mm long; lateral rays 7–8, porrect; central ray 0.3–0.7 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves elliptical, entire or shallowly lobed, with 2 pairs of acute lobes, lobing index 1–1.2; lamina 5.1–8.1 cm long, 2–5 cm wide, 1.6–2.5 times longer than broad; apex acute to acuminate, base cuneate, oblique part 0–2 mm long, obliqueness index 0–3 percent; petioles 0.9–2.8 cm long, 15–35% length of lamina, prickles present. Upper leaf surface green; prickles present on midvein and lateral veins, 7–13, straight, broad-based, 4–13 mm long; stellate hairs distributed throughout, hairs very sparse to sparse, 0.35–0.6 mm apart, 0.2–0.35 mm across, sessile, lateral rays 5–8, porrect; central ray 0.1–0.6 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface green; prickles 4–12, present on midvein and lateral veins, or sometimes on midvein only; stellate hairs very sparse to sparse, 0.25–0.5 mm apart, 0.2–0.4 mm diameter, stalks 0–0.05 mm long; lateral rays 4–8, porrect; central ray 0.1–0.8 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-axillary, unbranched; common peduncle absent or present, 0–3 mm long; rachis present, 2–7 mm long; 5–7-flowered, with all flowers bisexual, 4- or 5-merous; pedicels at anthesis 17–24 mm long, 0.4–0.6 mm thick, thickened towards apex, prickles present or absent. Calyx tube at anthesis 1–1.5

mm long; calyx lobes at anthesis rostrate, 1–1.5 mm long; calyx prickles almost always absent, rarely 1 present; calyx stellae dense, yellow or purple, 0.3–0.45 mm across, stalks 0–0.05 mm long, lateral rays 6–8, central ray 0.1–0.5 times as long as laterals, not gland-tipped, simple hairs absent. Corolla pale lavender, 10–14 mm long, deeply lobed, inner surface with sparse stellate hairs; anthers 3.8–4.7 mm long; filaments 1.4–1.8 mm long; ovary glabrous, functional style 6–7.5 mm long, protruding between anthers, glabrous. Fruiting calyx lobes less than half length of mature fruit, prickles absent; mature fruits 4–6 per inflorescence, globose, diameter unknown, bright red (Symon 10698 & Katik) at maturity; pedicels 27–28 mm long, thicker towards apex, 0.5–0.6 mm thick at midpoint. Seeds pale yellow, 2.9–3.2 mm long. **Figs. 9, 10.**

Additional specimens examined: Papua New Guinea. SOUTHERN HIGHLANDS PROVINCE: SE slopes of Mt Giluwe, IARO logging area, Jun 1977, Symon 10696 & Katik (AD); SE slopes of Mt Giluwe, Jun 1977, Symon 10698 & Katik (AD, CANB, L); Mt Giluwe, Munie timber track, Jun 1984, Symon 13885 (AD, L).

Distribution and habitat: *Solanum malignum* is known only from the vicinity of Mt Giluwe, to the south-west of Mount Hagen (**Map 1**), at altitudes from 2450 m to 2800 m. It reportedly grows in disturbed areas in logged *Nothofagus pullei* Steenis forest.

Phenology: Flowers and fruits are recorded for June.

Notes: The specimens of *Solanum malignum* cited above were included by Symon (1985) in *S. rivicola*. It differs from *S. rivicola* by its erect shrubby habit; the 5–12 mm long (and invariably straight) prickles on the branchlets (branchlet prickles strongly recurved, 1.5–4 mm long for *S. rivicola*); the stellate hairs of the branchlets with broad conical stalks to 0.6 mm long (slender stalks to 0.1 mm long for *S. rivicola*); the 7–13 prickles on the upper leaf surface (14–38 prickles for *S. rivicola*) and the 5–7-flowered inflorescences with pedicels 0.4–0.6 mm thick (1–2 flowered, pedicels 0.15–0.25 mm thick for *S. rivicola*).

Etymology: The specific epithet is from the Latin *malignus*, meaning ‘of evil nature’. This

refers to the many large prickles on the stems and leaves.

18. *Solanum missimense* Symon, *J. Adelaide Bot. Gard.* 8: 113 (1985). **Type:** Papua New Guinea. MOROBE PROVINCE: Lower to middle slopes of Mt Missim, 2 June 1984, D. Symon 13838 & A. Kairo (holo: AD; iso: BRI, CANB, K, L; LAE, MO *n.v.*).

For a description and discussion, see Symon (1985).

19. *Solanum nolense* Symon, *J. Adelaide Bot. Gard.* 8: 115 (1985). **Type:** Papua New Guinea. SOUTHERN HIGHLANDS PROVINCE: Between Nol and Mendi, 6 km from Nol, 24 June 1977, D. Symon 10688 & P. Katik (holo: AD; iso: CANB, K, L; LAE *n.v.*).

For a description and discussion, see Symon (1985).

20. *Solanum oomsis* A.R.Bean **sp. nov.** With affinity to *S. discolor*, but differing by the larger and broader leaves, the often branched inflorescences, the longer corolla, the smaller fruits and seeds, the moderately dense indumentum of the lower leaf surface, and the geminate leaves of the sympodia. **Typus:** Papua New Guinea. MOROBE PROVINCE: Oomsis Logging Area near Lae, 15 March 1960, E.E. Henty NGF11957 (holo: BRI; iso: CANB, L; LAE *n.v.*).

Erect perennial shrub, 3–3.5 m high. Sympodia bifoliate, geminate. Branchlets brown; prickles absent; branchlet stellate hairs dense to very dense, 0.25–0.4 mm diameter, stalks 0–0.1 mm long, slender, cylindrical; lateral rays 6–8, porrect; central ray 0.3–4 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves broadly ovate to elliptical, entire or with shallow lobes, lobing index 1–1.2; leaves 14.1–20 cm long, 5.7–10.5 cm wide, 1.8–2.5 times longer than broad; apex acute, base cuneate to obtuse, oblique part 2.5–7 mm long, obliqueness index 2–4 percent; petioles 1–3 cm long, 7–16% length of lamina, prickles absent. Upper leaf surface green; prickles absent; stellate hairs absent or confined to major veins; simple hairs absent. Lower leaf surface green to grey-green; prickles absent; stellate hairs



Fig. 9. Holotype of *Solanum malignum* (Symon 10696 & Katik, AD).



Fig. 10. Inflorescence of *Solanum malignum* (Symon 10696 & Katik, AD).

moderately dense, 0.2–0.3 mm apart, 0.3–0.5 mm diameter, stalks absent; lateral rays 7–8, porrect; central ray 0.2–1.5 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence leaf-opposed, unbranched or 2-branched; common peduncle 3–24 mm long; rachis 24–61 mm long, prickles absent; 14–35-flowered, with some flowers male, 5-merous; pedicels at anthesis 5–9 mm long, c. 0.3 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis 1–1.5 mm long; calyx lobes at anthesis elliptic or deltate, 0.5–1 mm long; calyx prickles absent; calyx stellae moderately dense to dense, white, 0.2–0.35 mm across, stalks 0–0.1 mm long, lateral rays 5–8, central ray 0.3–2 times as long as laterals, not gland-tipped, simple hairs absent. Corolla pale mauve to purple, 8–10 mm long, deeply lobed, inner surface glabrous; anthers 4.3–5.5 mm long; filaments 0.5–1.7 mm long; ovary glabrous; functional style c. 7.5 mm long, protruding between anthers, glabrous. Fruiting calyx lobes less than half length of mature fruit, prickles absent; mature fruits 1–3 per inflorescence, globose, c. 8 mm diameter, bright red at maturity; pedicels 20–23 mm long, thicker towards apex, 0.6–0.9 mm thick at midpoint. Seeds pale yellow, 2.2–2.6 mm long. **Figs. 11, 12.**

Additional specimens examined: Papua New Guinea. MOROBE PROVINCE: Oomsis Logging Area near Lae, Mar 1960, *Henty NGF11957* (BRI, CANB, L). MADANG PROVINCE: Between villages of Dimir and Basken in the hills behind Dylup plantation, c. 50 miles [80 km] N of Madang, Oct 1958, *Pullen 1207* (CANB, L).

Distribution and habitat: *Solanum oomsis* is known from two widely separated sites close to the north-east coast of Papua New Guinea (**Map 1**). Altitude ranges from 60 to 250 metres. It occurs in “garden regrowth” or in logged forest.

Phenology: Flowers and fruits have been collected in March and October.

Notes: The specimens of *Solanum oomsis* cited above were included by Symon (1985) in *S. turraeifolium* (= *S. discolor*). *S. oomsis* has unarmed stems, broadly elliptic slightly-lobed leaves, glabrous upper leaf surfaces, moderately dense lower surfaces, unbranched or 2-branched inflorescences, and red fruits c. 8 mm diameter. It differs from *S. discolor* by the larger and broader leaves, the often branched inflorescences, the longer corolla, the smaller fruits and seeds, the moderately dense indumentum of the lower leaf surface, and the geminate leaves of the sympodia. The collection from Madang province differs from the type by the stellate hairs having a shorter central ray, the shorter petioles and the somewhat narrower laminae.

Etymology: The specific epithet refers to the Oomsis Logging Area. It is used as a noun in apposition.

21. *Solanum ortivum* A.R.Bean sp. nov. With affinity to *S. anfractum*, but differing by the greater number of flowers per inflorescence and the much longer rachis, the very short central ray of the stellate hairs, the shorter anthers, and the sparse indumentum on the lower leaf surface. **Typus:** Papua New Guinea. MADANG PROVINCE: Sewe, Saidor subdistrict, 10 August 1964, *C.D. Sayers NGF 19832* (holo: BRI; iso: LAE n.v.).

Erect perennial shrub, c. 3 m high. Sympodia bifoliate, geminate. Branchlets brown; prickles 35–52 per dm, straight, broad-based, 0.2–1.2 mm long, 1–2 times longer than wide, with dense stellate hairs at base; branchlet

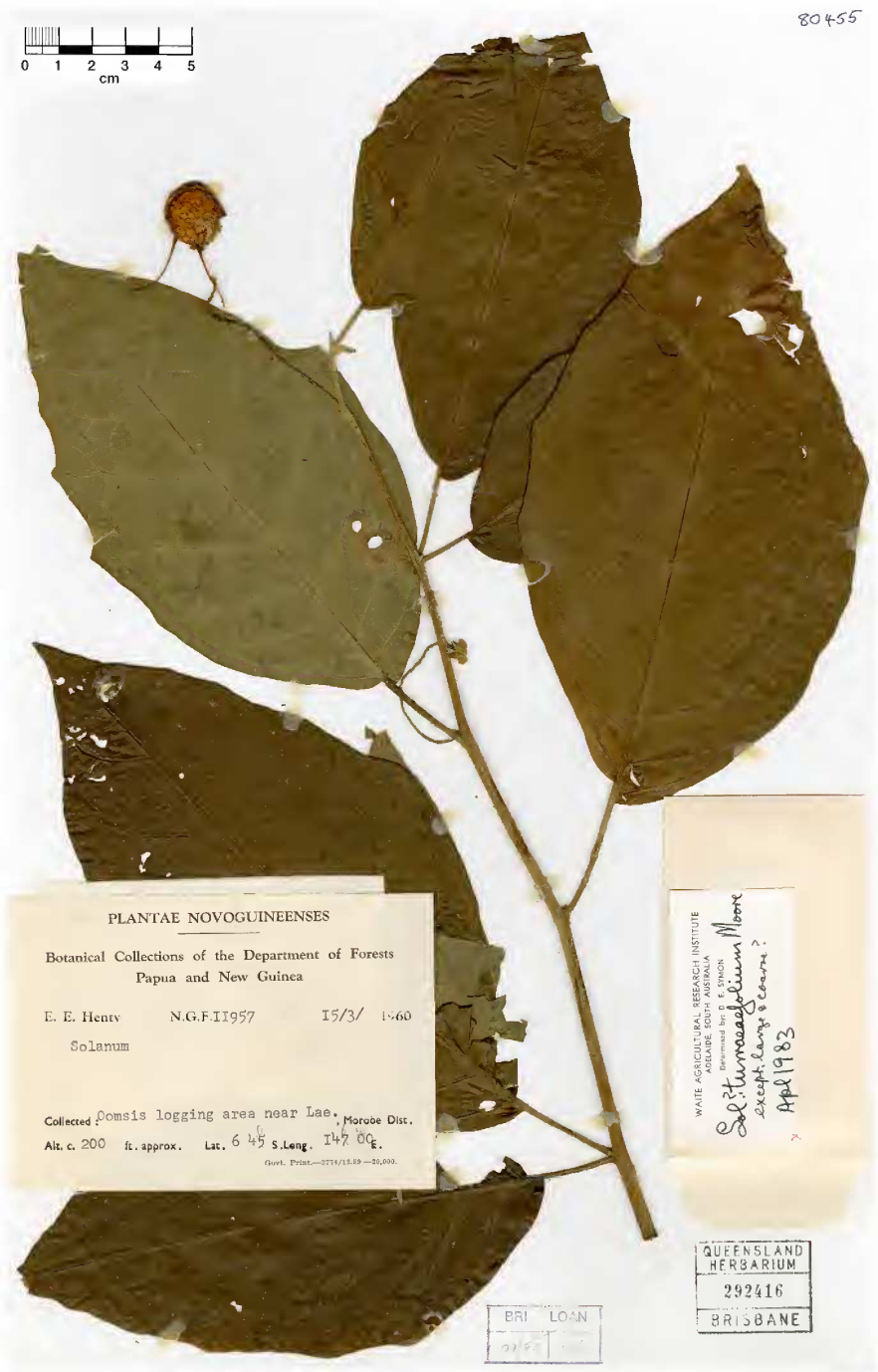


Fig. 11. Holotype of *Solanum oomsis* (Henty NGF11957, BRI).



Fig. 12. Branched inflorescence of *Solanum oomsis* (Henty NGF11957, CANB).

stellate hairs frequent to dense, 0.15–0.25 mm diameter, stalks absent; lateral rays 6–8, porrect; central ray 0.4–0.7 times as long as laterals, not gland-tipped. Adult leaves elliptical, entire, 5–7.7 cm long, 2.1–3.1 cm wide, 2.2–2.5 times longer than broad; apex acute to acuminate, base cuneate, oblique part 0–6 mm long, obliqueness index 0–8 percent; petioles 0.45–0.9 cm long, 9–16% length of lamina, prickles absent. Upper leaf surface dark green; prickles absent; stellate hairs distributed throughout, very sparsely distributed, 0.25–0.6 mm apart, 0.1–0.15 mm across, sessile, lateral rays 4–8, porrect; central ray 0.1–0.4 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface greenish-white; prickles absent; stellate hairs sparse, 0.2–0.4 mm apart, 0.2–0.3 mm diameter, stalks absent; lateral rays 4–8, porrect; central ray 0–0.2 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence leaf-opposed, unbranched; common peduncle 15–31 mm long; rachis 30–63 mm long, prickles absent; 8–20-flowered, 4–5-merous; pedicels at anthesis *c.* 15 mm long and 0.3 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis *c.* 1.5 mm long; calyx lobes at anthesis elliptic, *c.* 0.5 mm long; calyx prickles absent; calyx stellae moderately dense to dense, white, 0.2–0.3 mm across, stalks absent, lateral rays 5–8, central ray 0.1–0.4 times as long as laterals, not gland-tipped, simple hairs absent. Corolla purple, *c.*

8 mm long, deeply lobed, inner surface with sparse stellate hairs, mainly near lobe apices; anthers 2.4–3 mm long; functional style *c.* 5 mm long, protruding between anthers, glabrous. Fruiting calyx lobes less than or more than half length of mature fruit, prickles absent; fruits 1–2 per inflorescence, globose, diameter and colour at maturity unknown; pedicels of immature fruits 11–15 mm long, cylindrical or thicker towards apex. Seeds not seen. **Fig. 13, 14.**

Additional specimens examined: Known only from the type.

Distribution and habitat: *Solanum ortivum* has been collected so far, only at Sewe, in Madang province (**Map 1**), at an altitude of 2300 metres. It inhabits rainforest.

Phenology: Flowers and immature fruits recorded for August.

Notes: The type of *Solanum ortivum* was included by Symon (1985) in *S. anfractum*. It shares with *S. anfractum* the geminate leaves of the sympodia, the rather zig-zag stems, and the very sparse indumentum on the upper leaf surface. However, *S. ortivum* differs in several ways from *S. anfractum*; the rachis of the inflorescence 30–63 mm long (1–12 mm long for *S. anfractum*), the 8–20 flowers per inflorescence (1–3 flowered for *S. anfractum*); the stellate hairs of the upper leaf surface 0.1–0.15 mm diameter (0.25–0.4 mm diameter for *S. anfractum*); the anthers 2.4–3 mm long (5–7.5 mm long for *S. anfractum*), and the frequent very short branchlet prickles with a stellate-hairy base (branchlet prickles glabrous for *S. anfractum*).

Etymology: From the Latin *ortivus* “of rising”, or “the eastern or dawn side”. This is given in reference to the occurrence of this species to the east of the Ramu Highway, where no collections of *S. anfractum* have been made.

22. *Solanum papuanum* Symon, *J. Adelaide Bot. Gard.* 8: 116 (1985). **Type:** Papua New Guinea. EASTERN HIGHLANDS PROVINCE: Marafunga Logging Area, upper Asaro valley, near Goroka, 7 September 1961, *J.S. Womersley & H.O. Sleumer* NGF13992 (holo: LAE *n.v.*; iso: BRI, K, L.).

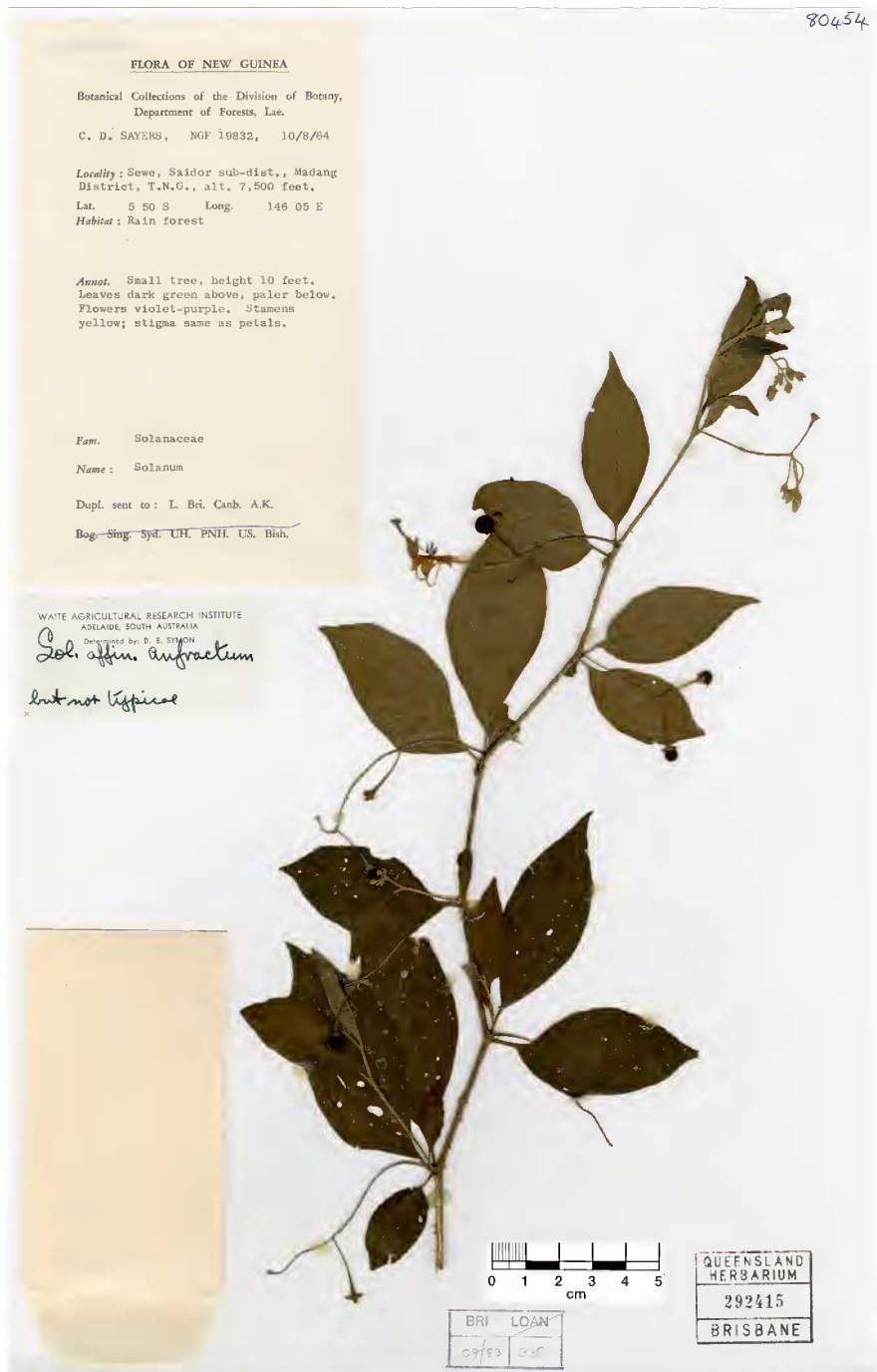


Fig. 13. Holotype of *Solanum ortivum* (Sayers NGF 19832, BRI).



Fig. 14. Inflorescence of *Solanum ortivum* (Sayers NGF 19832, BRI).

Erect perennial shrub, 1–1.2 m high. Sympodia bifoliate, geminate. Branchlets brown to rusty; prickles 14–20 per dm, straight, broad-based, 0.5–5 mm long, 1–1.5 times longer than wide, with stellate hairs throughout lower part; branchlet stellate hairs dense to very dense, 0.6–1.0 mm diameter, stalks 0–0.5 mm long; lateral rays 6–9, porrect; central ray 0–0.2 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves ovate, broadly ovate or elliptical, entire, 6.4–15 cm long, 3–6 cm wide, 1.9–2.5 times longer than broad; apex acute, base cuneate, oblique part 0–6 mm long, obliqueness index 0–4 percent; petioles 1.2–2.5 cm long, 16–19% length of lamina, prickles absent or present. Upper leaf surface green; prickles absent or sometimes present on midvein only, 0–7, straight, broad-based, 2–8 mm long; stellate hairs distributed throughout, moderately dense to dense, 0.2–0.4 mm apart, 0.3–0.8 mm across, stalks 0–0.3 mm long, lateral rays 1–7, ascending; central ray 0.2–0.5 times as long as laterals, not gland-tipped; simple hairs usually present, 0.1–0.3 mm long, 0.1–0.5 mm apart. Lower leaf surface yellow to rusty; prickles absent or rarely present, 0–2, confined to midrib; stellate hairs very dense, 0–0.05 mm apart, 0.45–0.6 mm diameter, stalks 0–0.4 mm long; lateral rays 7–8, porrect; central ray 0.1–0.2 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-

axillary, unbranched; common peduncle 0–6 mm long; rachis 3–27(–53) mm long, prickles absent or present; 8–16-flowered, with most flowers bisexual, 5-merous; pedicels at anthesis 8–9 mm long, 0.6–0.8 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis 1.5–2 mm long; calyx lobes at anthesis elliptic to deltate, 0.5–1 mm long; calyx prickles absent; calyx stellae very dense, rusty, 0.35–0.5 mm across, stalks 0–0.25 mm long, lateral rays 6–8, central ray 0.1–0.3 times as long as laterals, not gland-tipped, simple hairs absent. Corolla mauve, 11–12 mm long, shallowly lobed, inner surface with very sparse stellate hairs; anthers 2.5–3.8 mm long; filaments c. 1.2 mm long; ovary glabrous; functional style c. 6.5 mm long, protruding between anthers, glabrous. Fruiting calyx lobes less than half length of mature fruit, prickles absent; mature fruits 3–8 per inflorescence, globose, 9–14 mm diameter, black (McKee & Floyd 6356) or red (Croft LAE61900) at maturity; pedicels 17–23 mm long, thicker towards apex, c. 1.1 mm thick at midpoint.

Additional specimens examined: Papua New Guinea. MOROBE PROVINCE: Katom River field site, via Yawan village, Sarawagel Range, Huon peninsula, Aug 2004, Jensen NG943 & Fazang (BRI). CENTRAL PROVINCE: SE slope to Lake Myola No. 2, Sep 1973, Croft & Lelean NGF34817 (BRI, L); E side lake Myola No. 1, Jul 1974, Croft LAE61900 (BRI). EASTERN HIGHLANDS PROVINCE: Mt Wilhelm, E slopes, Jul 1959, Brass 30725 (L, NY); Daulo – Chuave Road, Nov 1954, McKee & Floyd 6356 (BRI, L); Fatima River, Goroka subdistrict, May 1965, Millar NGF22538 (BRI, L); Fatima River, Marafunga, Goroka subdistrict, Nov 1968, Millar NGF40709 (BRI, L); Daulo camp, Asaro-Mairifutica divide, Aug 1957, Pullen 397 (L). SOUTHERN HIGHLANDS PROVINCE: Between Kagoba and Border gate, subdistrict Mendi, Nov 1973, Womersley NGF46444 (BRI, L).

Distribution and habitat: *Solanum papuanum* is widespread in Papua New Guinea, but known from just a few areas (Map 3), at altitudes ranging from 1800 to 2600 metres. It grows in open areas along roadside adjacent to submontane rainforest, or in regrowth from logging.

Phenology: Flowers are recorded for May, July, August, September and November; fruits in July, September and November.

Notes: *Solanum papuanum* can be distinguished by the very dense indumentum on the lower leaf surfaces, and the stellate hairs on the upper leaf surfaces having ascending lateral rays, with some hairs reduced to a simple form. Some of the specimens cited under *S. papuanum* by Symon (1985) are here referred to *S. trichostylum* or *S. arachnoides*.

The collection *Croft LAE61900* is atypical because of the more prominent venation on the underside of the leaves, the large fruits and the long rachis of the inflorescence. *Millar NGF40709* is also atypical because of its small leaves and quite slender prickles on the branchlets and leaves.

23. *Solanum petilum* A.R.Bean sp. nov. With affinity to *S. trichostylum* but differing by the very dense tomentum on the lower leaf surface, the 4-merous flowers, the stellate hairs of the lower leaf surface with 8–14 lateral rays, and the slender prickles on the upper leaf surface and branchlets. **Typus:** Papua New Guinea. CENTRAL PROVINCE: W slopes of Mt Kenive (Nisbet), 26 July 1974, J.R. Croft LAE65050 (holo: BRI; iso: CANB, L).

Erect perennial shrub c. 1.5 m high. Sympodia bifoliate, geminate or disjunct. Branchlets grey to yellow; prickles 4–28 per dm, straight, needle-like or broad-based, 0.5–3.5 mm long, 4–8 times longer than wide, glabrous or with stellate hairs throughout lower part; branchlet stellate hairs very dense, 0.25–0.6 mm diameter, stalks 0–0.1 mm long; lateral rays 8–10, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; simple hairs absent, simple hairs absent. Adult leaves ovate to elliptical, entire, 7.2–9.4 cm long, 2.2–3.5 cm wide, 2.3–3.3 times longer than broad; apex acute, base cuneate, oblique part 0–2 mm long, obliqueness index 0–3 percent; petioles 1.1–2.2 cm long, 15–25% length of lamina, prickles absent. Upper leaf surface green; prickles present on midvein and lateral veins or on midvein only, 1–12, straight, needle-like, 1–5 mm long; stellate hairs distributed throughout, sparse to moderately dense, 0.2–0.5 mm apart, 0.35–0.5 mm across, sessile, lateral rays 4–8, porrect;

central ray 1–2 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface yellowish; prickles absent; stellate hairs very dense, 0–0.05 mm apart, 0.25–0.45 mm diameter, stalks 0–0.1 mm long; lateral rays 8–14, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-axillary, unbranched; common peduncle 0–2 mm long; rachis 7–19 mm long, prickles absent; 4–13-flowered, flowers bisexual, 4-merous; pedicels at anthesis 9–13 mm long, 0.8–0.9 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis 1.5–2 mm long; calyx lobes at anthesis elliptic, 1.5–2.5 mm long; calyx prickles absent; calyx stellae very dense, yellow, 0.25–0.35 mm across, stalks 0–0.1 mm long, lateral rays 8–10, central ray 0.5–1 times as long as laterals, not gland-tipped, simple hairs absent. Corolla purple, c. 11 mm long, shallowly lobed, inner surface with sparse stellate hairs; anthers 2.6–3.2 mm long; filaments 1.5–2 mm long; ovary with scattered tiny glandular hairs; functional style c. 5.5 mm long, protruding between anthers, with scattered tiny glandular hairs on lower one-third, otherwise glabrous. Fruiting calyx lobes less than half length of fruit, prickles absent; mature fruits and seeds not seen. **Figs. 15, 16, 17, 18.**

Additional specimens examined: Known only from the type.

Distribution and habitat: *Solanum petilum* is known only from one location near the boundary of Central and Northern provinces (**Map 2**), at an altitude of 3000 metres. It grows in submontane rainforest.

Phenology: Flowers and immature fruits are recorded for July.

Notes: The type specimens of *Solanum petilum* were included by Symon (1985) under *S. trichostylum*. *S. petilum* differs from that species by the very dense tomentum on the lower leaf surface (moderately dense for *S. trichostylum*), the 4-merous flowers (5-merous for *S. trichostylum*), the stellate hairs of the lower leaf surface with 8–14 lateral rays (6–8 lateral rays for *S. trichostylum*), and the slender prickles on the upper leaf surface

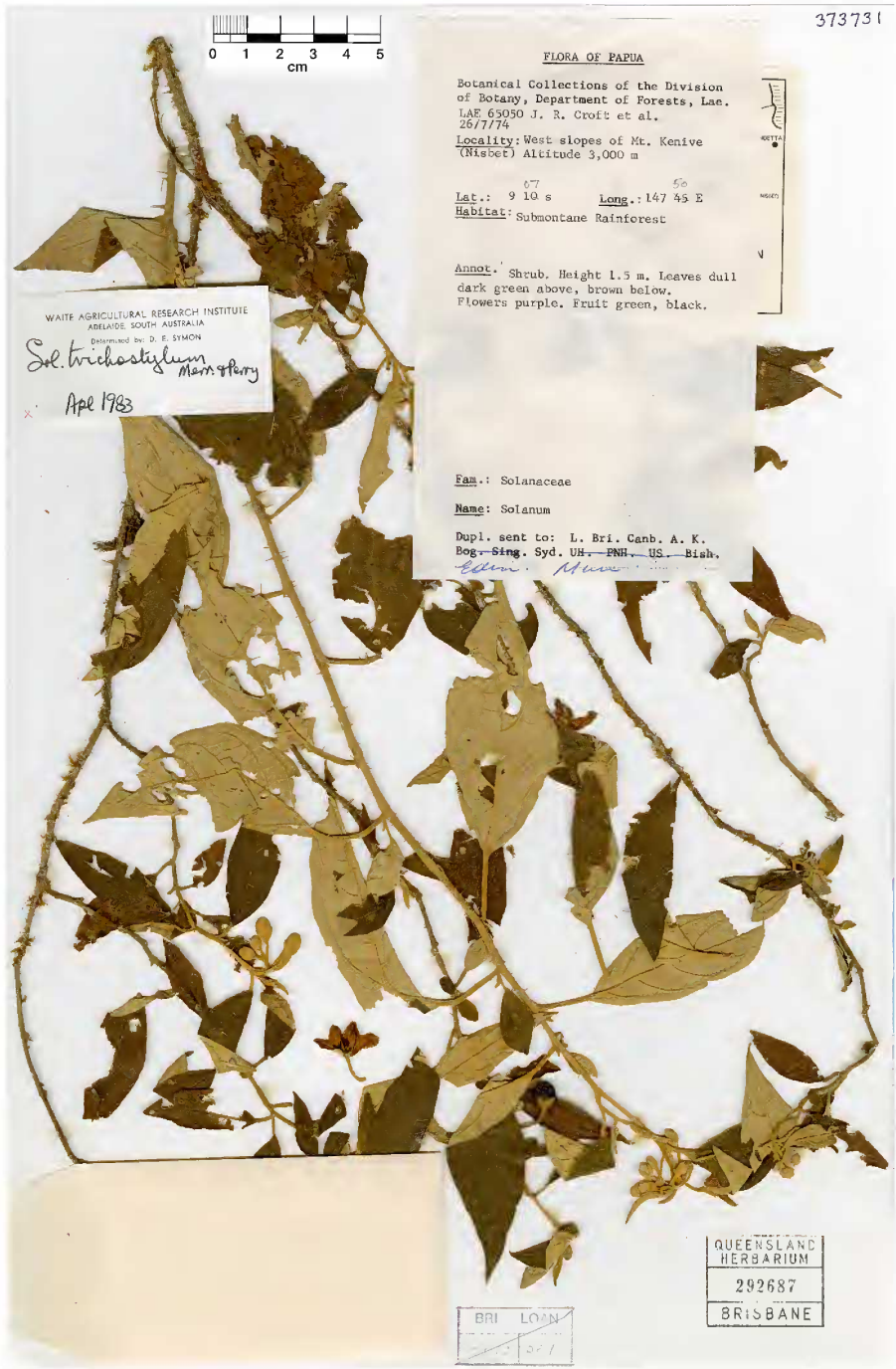


Fig. 15. Holotype of *Solanum petilum* (Croft LAE65050, BRI).



Fig. 16. Section of branchlet showing slender prickles of *Solanum petilum* (Croft LAE65050, BRI).

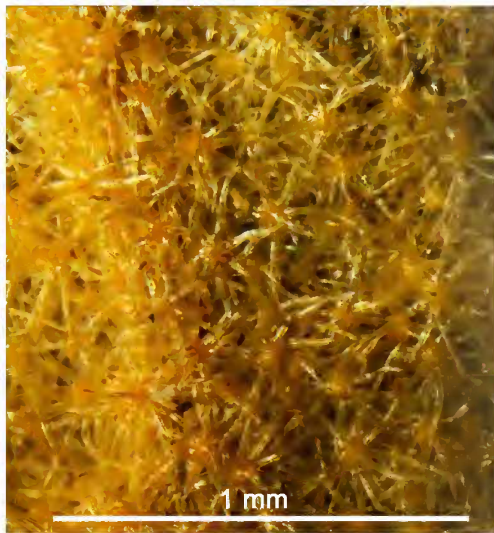


Fig. 17. Underside of leaf of *Solanum petilum*, showing multi-rayed stellate hairs (Croft LAE65050, BRI).



Fig. 18. Opened out flower of *Solanum petilum* (Croft LAE65050, BRI).

and branchlets 3–8 times longer than broad (broad-based prickles, 1–2 times longer than broad for *S. trichostylum*).

The name of the mountain from which the type was collected now appears in the gazetteers as Mt Kanevi. All occurrences of *S. trichostylum* are disjunct from *S. petilum* by more than 90 km.

Etymology: The specific epithet is from the Latin *petilus*, meaning ‘slender, thin’. This refers to the slender prickles possessed by this species, in comparison with its relatives.

24. *Solanum phoberum* A.R.Bean sp. nov. With affinity to *S. rivicola*, but differing by the upright shrubby habit, the straight prickles of the branchlets, the fewer prickles on the upper leaf surface, the stellate hairs absent from lower leaf surface or confined to the veins, and the thicker pedicels. **Typus:** Papua New Guinea. EASTERN HIGHLANDS PROVINCE. Mt Wilhelm, E slopes, high bank of Pengagl Creek, 9 July 1959, L.J. Brass 30401 (holo: CANB; iso: L, NY).

Erect perennial shrub, up to 2.5 m high. Sympodia bifoliate, disjunct. Branchlets brown; prickles 14–30 per dm, straight, broad-based, 1–3.5 mm long, 2–3 times longer than wide, glabrous; branchlet

stellate hairs scattered to frequent, 0.3–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 0–0.3 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves broadly-ovate to elliptical, entire, 2.7–4.5 cm long, 1.7–2.7 cm wide, 1.6–2.1 times longer than broad; apex acute, base cuneate to obtuse, oblique part 0–1.5 mm long, obliqueness index 0–4 percent; petioles 0.6–0.8 cm long, 16–25% length of lamina, prickles present. Upper leaf surface dark green; prickles present on midvein and lateral veins, or along midvein only, 3–11, straight, broad-based, 2–9 mm long; stellate hairs confined to major veins or absent; simple hairs absent. Lower leaf surface green; prickles present on midvein and lateral veins, 5–8; stellate hairs absent or confined to major veins; simple hairs absent. Inflorescence supra-axillary, unbranched; common peduncle 0–2 mm long; rachis 1–3 mm long, prickles absent; 1(or 2)-flowered, with all flowers bisexual, 4-merous; pedicels at anthesis 13–23 mm long, c. 0.5 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis c. 2.0 mm long; calyx lobes at anthesis rostrate to attenuate, 2.5–3 mm long; calyx prickles absent or present, 0–3; calyx stellae sparse, yellow, 0.2–0.3 mm across, stalks absent, lateral rays 6–8, central ray 0.5–1 times as long as laterals, not gland-tipped, simple hairs absent. Corolla white above, purple below, 11–16 mm long, deeply lobed, inner surface glabrous; anthers 5.2–5.7 mm long; filaments 2.2–2.5 mm long; ovary glabrous; functional style 8–8.5 mm long, protruding between anthers, glabrous. Fruiting calyx lobes less than or more than half length of mature fruit, prickles absent or present, 0–3; fruits 1 per inflorescence, mature fruits not seen; pedicels 24–28 mm long, cylindrical or thicker towards apex, 0.6–0.9 mm thick at midpoint. Seeds not seen.

Figs. 19, 20.

Additional specimens examined: Papua New Guinea. EASTERN HIGHLANDS PROVINCE: Komanemambino, Oct 1960, *Borgmann 246* (L); Mt Wilhelm, E slopes, high bank of Pengagl Creek, Jul 1959, *Brass 30401* (CANB, L, NY).

Distribution and habitat: *Solanum phoberum* is only known from the vicinity of Mount

Wilhelm, between 2770 and 2900 metres (**Map 4**). It reportedly grows on “forest edges”.

Phenology: Flowers and immature fruits recorded for July and October.

Notes: Specimens cited above as *Solanum phoberum* were included by Symon (1985) under *S. rivicola*. *S. phoberum* can be distinguished by the many prickles on the leaves and branchlets, and the leaves glabrous or with a few scattered stellate hairs on the major veins. It is perhaps allied to *S. rivicola*, but differs by the upright shrubby habit, the straight prickles of the branchlets (strongly recurved for *S. rivicola*), the 3–11 prickles on the upper leaf surface (14–38 for *S. rivicola*), the stellate hairs absent from lower leaf surface or confined to the veins (hairs distributed throughout surface, very sparse to sparse for *S. rivicola*), and the thicker pedicels.

Etymology: The epithet is a Latinised form of the Greek *phoberos*, meaning fearful, terrible or formidable. This is given in reference to the many sharp prickles on the stems and leaves.

25. *Solanum pluriflorum* A.R.Bean sp. nov.

With affinity to *S. oomsis*, but differing by the presence of prickles on the branchlets and often on the leaves, the larger stellate hairs of the branchlets, the sparse to moderately dense stellate hairs on the upper leaf surface, the 4-merous flowers and the attenuate calyx lobes. **Typus:** Papua New Guinea. EASTERN HIGHLANDS PROVINCE: Kassam Gap, 29 October 1959, *L.J. Brass 32309* (holo: CANB; iso: L, NY).

Erect perennial shrub, up to 2 m high. Sympodia bifoliate, geminate. Branchlets grey to brown; prickles prickles 5–13 per dm, straight, broad-based, 1–1.5 mm long, 1–1.5 times longer than wide, with scattered stellate hairs on lower part; branchlet stellate hairs dense, 0.4–0.55 mm diameter, stalks 0–0.2 mm long, slender, cylindrical; lateral rays 7–8, porrect; central ray 1.5–3 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves obovate to elliptical, with 1–3 pairs of shallow lobes, lobes obtuse, lobing index 1.2–1.5; leaves 6.9–11.5 cm long, 3.2–6.6 cm wide, 1.6–2.2 times longer than



Fig. 19. Holotype of *Solanum phoberum* (Brass 30401, CANB).



Fig. 20. Underside of leaf and flower bud of *Solanum phoberum* (Brass 30401, CANB).

broad; apex acuminate, base cuneate, oblique part 0–1.5 mm long, obliqueness index 0–2 percent; petioles 0.4–1.6 cm long, 7–14% length of lamina, prickles absent. Upper leaf surface green; prickles absent or present on midvein only, 0–1, straight and broad-based, each 1–2 mm long; stellate hairs distributed throughout, sparse to moderately dense, 0.25–0.5 mm apart, 0.4–0.5 mm diameter, stalks 0–0.1 mm long, slender, cylindrical; lateral rays 4–6, porrect; central ray 1.5–2.5 times as long as laterals, not gland tipped; simple hairs absent. Lower leaf surface yellow to yellowish-green; prickles absent or present on midvein only, 0–3; stellate hairs moderately dense, 0.2–0.3 mm apart, 0.4–0.5 mm diameter, stalks 0–0.2 mm long; lateral rays 7–8, porrect; central ray 1–2 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence leaf-opposed, 2- or 3-branched; common peduncle 22–47 mm long; rachis 28–62 mm long, prickles absent; 7–26-flowered, proportion of bisexual and male flowers unknown, 4-merous; pedicels at anthesis 11–12 mm long, c. 0.4 mm thick,

same thickness throughout, prickles absent. Calyx tube at anthesis c. 2 mm long; calyx lobes at anthesis attenuate, 1.5–2 mm long; calyx prickles absent; calyx stellae dense to very dense, white, 0.3–0.4 mm across, stalks 0–0.1 mm long, lateral rays 6–8, central ray 1.5–3 times as long as laterals, not gland-tipped, simple hairs absent. Corolla lavender, 7–8 mm long, deeply lobed, inner surface glabrous, or with a few stellate hairs along midrib; anthers 4.5–4.9 mm long; filaments 1.4–1.7 mm long; ovary glabrous; functional style c. 6.5 mm long, protruding between anthers, glabrous. Fruiting calyx lobes more than half length of fruit, prickles absent; mature fruits not seen; pedicels 20–22 mm long, thicker towards apex, 0.5–0.6 mm thick at midpoint. Seeds not seen. **Figs. 21, 22.**

Additional specimens examined: Known only from the type.

Distribution and habitat: *Solanum pluriflorum* is known only from Kassam Gap, altitude 1460 metres (**Map 4**), where it occurs in young regrowth *Castanopsis*-oak forest.

Phenology: Flowers and immature fruits recorded in October.

Notes: The type specimen of *Solanum pluriflorum* was identified by Symon (1985) as *S. turraeifolium* (= *S. discolor*). It differs from *S. discolor* by the 2–3 branched inflorescences (unbranched for *S. discolor*), the leaves 1.6–2.2 times longer than broad (2.3–4.3 times for *S. discolor*), the stellate hairs of the branchlets 0.4–0.55 mm across (0.25–0.4 mm across for *S. discolor*), the sparse to moderately dense stellate hairs on the upper leaf surface (glabrous or confined to major veins in *S. discolor*), and the 4-merous flowers (5-merous in *S. discolor*).

S. pluriflorum is probably most closely related to *S. oomsis*, but differs by the presence of prickles on the branchlets and often on the leaves (prickles absent in *S. oomsis*), the stellate hairs of the branchlets 0.4–0.55 mm across (0.25–0.4 mm across for *S. oomsis*), the sparse to moderately dense stellate hairs on the upper leaf surface (glabrous or confined to major veins in *S. oomsis*), the 4-merous flowers (5-merous in *S. oomsis*) and the



Fig. 21. Holotype of *Solanum pluriflorum* (Brass 32309, CANB).



Fig. 22. Inflorescence of *Solanum pluriflorum* (Brass 32309, CANB).

attenuate calyx lobes (elliptic or deltate in *S. oomsis*).

Etymology: The specific epithet is from the Latin *pluriflorus*, meaning many-flowered. This species has more flowers per inflorescence than most others in the *S. ferocissimum* group.

26. *Solanum rivicola* Symon, *J. Adelaide Bot. Gard.* 8: 118 (1985). **Type:** Papua New Guinea. MOROBE PROVINCE: Road from Bulolo above Edie Creek, 30 May 1977, *D.E Symon 10638* & *A. Kairo* (holo: AD; iso: L, MO, US; A, K, LAE, all *n.v.*).

Sprawling terrestrial ?vine to 0.3 m high. Sympodia bifoliate, disjunct. Branchlets brown; prickles 20–61 per dm, strongly recurved, broad-based, 1.5–4 mm long, 1–2 times longer than wide, glabrous throughout; branchlet stellate hairs scattered to frequent, 0.35–0.6 mm diameter, stalks 0–0.1 mm long; lateral rays 4–8, porrect; central ray 0.2–1 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves narrowly ovate to ovate or elliptical, entire, 3.5–6.8 cm long, 1.2–3.4 cm wide, 1.8–3.3 times longer than broad; apex acute to acuminate, base cuneate, oblique part 0–2 mm long, obliqueness index 0–5 percent; petioles

0.45–1.2 cm long, 13–18% length of lamina, prickles present. Upper leaf surface dark green; prickles present on midvein and lateral veins, 14–38, straight, broad-based, 1–8 mm long; stellate hairs confined to major veins or distributed throughout, hairs absent or very sparsely distributed, 0.8–1.8 mm apart, 0.3–0.45 mm across, sessile, lateral rays 4–8, porrect; central ray 0.8–1.5 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface pale green; prickles 5–13, present on midvein and lateral veins; stellate hairs very sparse to sparse, 0.3–1 mm apart, 0.3–0.4 mm diameter, stalks 0–0.05 mm long; lateral rays 4–8, porrect; central ray 0.5–1.6 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-axillary, unbranched; common peduncle absent; rachis absent; 1–2-flowered, with all flowers bisexual, (4–)5-merous; pedicels at anthesis 12–19 mm long, 0.15–0.25 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis 1–2.5 mm long; calyx lobes at anthesis elliptic, 0.5–1 mm long; calyx prickles absent; calyx stellae sparse to moderately dense, yellow, 0.15–0.3 mm across, sessile, lateral rays 4–8, central ray 0.3–1 times as long as laterals, not gland-tipped, simple hairs absent. Corolla purple, 7–12 mm long, deeply lobed, inner surface glabrous or with very sparse stellate hairs; anthers 5–5.9 mm long; filaments 1.7–2 mm long; ovary glabrous; functional style 7–8 mm long, protruding between anthers, glabrous. Fruiting material not seen.

Additional specimens examined: Papua New Guinea. MOROBE PROVINCE: Bulldog Road, c. 20 km S of Wau, Jul 1977, *Fallen 534* (L); N slope of Mt Kaindi, Wau subprovince, Nov 1983, *Kerenga & Dao LAE56630* (AD); Kaisenik, Aug 1977, *Rau 100* (CANB); Bulldog track, Edie Creek, Sep 1964, *Sayers NGF21222* (BRI, CANB, L); Road from Bulolo above Edie Creek, May 1977, *Symon 10638* & *Kairo* (AD). CENTRAL PROVINCE: Boridi, Sep 1935, *Carr 13200* (CANB, L).

Distribution and habitat: *Solanum rivicola* is known from four sites in close proximity in Morobe province, and an outlier 200 km further south in Central province (**Map 4**). Altitude ranges from 1300 to 2900 metres. Habitats include along a freshwater creekline in peaty soil, and in a disturbed montane forest.

Phenology: Flowers are recorded for May and from July to September.

Notes: *Solanum rivicola* is readily distinguished by its strongly recurved prickles on the branchlets, the more or less glabrous upper leaf surface, the filamentous pedicels and the slender corolla lobes.

In the protologue, an isotype is listed for CANB. However, no isotype is present there (B. Lepschi *pers. comm.* Apr 2016).

Symon (1985) included under the name *S. rivicola*, many specimens showing a large range of variation. Most of these specimens are here assigned to *S. exemptum*, *S. malignum*, *S. phoberum* or *S. scolophyllum*.

27. *Solanum saruwagedense* Symon, *J. Adelaide Bot. Gard.* 8: 120 (1985). **Type:** Papua New Guinea. MOROBE PROVINCE: Along slope of Zaran Creek, SW slope of Mt Enggom, Sarawaket Range, 24 February 1963, *P. Van Royen NGF16142* (holo: LAE n.v.; iso: L).

For a description and discussion, see Symon (1985).

28. *Solanum scolophyllum* A.R.Bean **sp. nov.** With affinity to *S. malignum*, but differing by the sprawling terrestrial habit, the shorter branchlet prickles, the stellate hairs of the branchlets lacking broad conical stalks, and the shorter pedicels. **Typus:** Papua New Guinea. SOUTHERN HIGHLANDS PROVINCE: 3 miles [5 km] from camp site on Mendi Road, Mendi subdistrict, 26 September 1968, *J. Vandenberg, P. Katik & A. Kairo NGF 39796* (holo: BRI; iso: L; LAE n.v.).

Terrestrial herb. Sympodia bifoliate, disjunct. Branchlets brown; prickles 10–48 per dm, straight, broad-based, 1–4 mm long, 2–3 times longer than wide, glabrous throughout or rarely with a few stellate hairs attached; branchlet stellate hairs frequent to dense, 0.35–0.7 mm diameter, stalks cylindrical, 0–0.25 mm long; lateral rays 6–8, porrect; central ray 0.3–1.3 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves elliptical to ovate, entire; lamina 3.5–6.4 cm long, 1.6–2.5 cm wide, 2–2.7 times longer than broad; apex acute to acuminate, base cuneate, oblique part

0–1 mm long, obliqueness index 0–3 percent; petioles 0.6–0.8 cm long, 12–21% length of lamina, prickles present. Upper leaf surface green; prickles present on midvein and lateral veins, 5–34, straight, broad-based, 1.5–6 mm long; stellate hairs distributed throughout, hairs sparse to moderately dense, 0.25–0.45 mm apart, 0.15–0.6 mm across, sessile, lateral rays 4–8, porrect; central ray 0.2–0.8 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface yellowish-green; prickles 4–23, present on midvein and lateral veins; stellate hairs sparse to moderately dense, 0.25–0.9 mm apart, 0.3–0.6 mm diameter, stalks 0–0.1 mm long; lateral rays 4–8, porrect; central ray 0.3–1.5 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence supra-axillary, unbranched; common peduncle absent or present, 0–4 mm long; rachis present, 1–9 mm long; 2–7-flowered, with all flowers bisexual, 5-merous; pedicels at anthesis 9–14 mm long, 0.3–0.7 mm thick, cylindrical, prickles absent. Calyx tube at anthesis 1–2.5 mm long; calyx lobes at anthesis rostrate, 1–3 mm long; calyx prickles absent; calyx stellae sparse to very dense, yellow, 0.25–0.4 mm across, stalks 0–0.05 mm long, lateral rays 5–8, central ray 0.3–1.5 times as long as laterals, not gland-tipped, simple hairs absent. Corolla white, 9–10 mm long, shallowly or deeply lobed, inner surface glabrous or with dense stellate hairs on distal half; anthers 4–4.5 mm long; functional style c. 6 mm long, protruding between anthers, glabrous, stigma entire. Fruiting calyx lobes less than half length of mature fruit, prickles absent; fruits 2–5 per inflorescence, mature fruits not seen; pedicels 23–25 mm long, cylindrical, 0.7–0.8 mm thick at midpoint. Seeds not seen. **Figs. 23, 24.**

Additional specimens examined: Papua New Guinea. SOUTHERN HIGHLANDS PROVINCE: Vicinity of Habono rest house, 6.5 miles [10.5 km] W of Mt Ne, Tari, Aug 1966, *Frodin NGF 32059* (BRI, L); 3 miles [5 km] from camp site on Mendi road, Mendi subdistrict, Sep 1968, *Vandenberg et al. NGF 39796* (BRI, L).

Distribution and habitat: *Solanum scolophyllum* is known from two sites in the Southern Highlands province (**Map 4**), with altitudes between 2100 and 2800 metres. It grows on disturbed sites adjacent to forest.

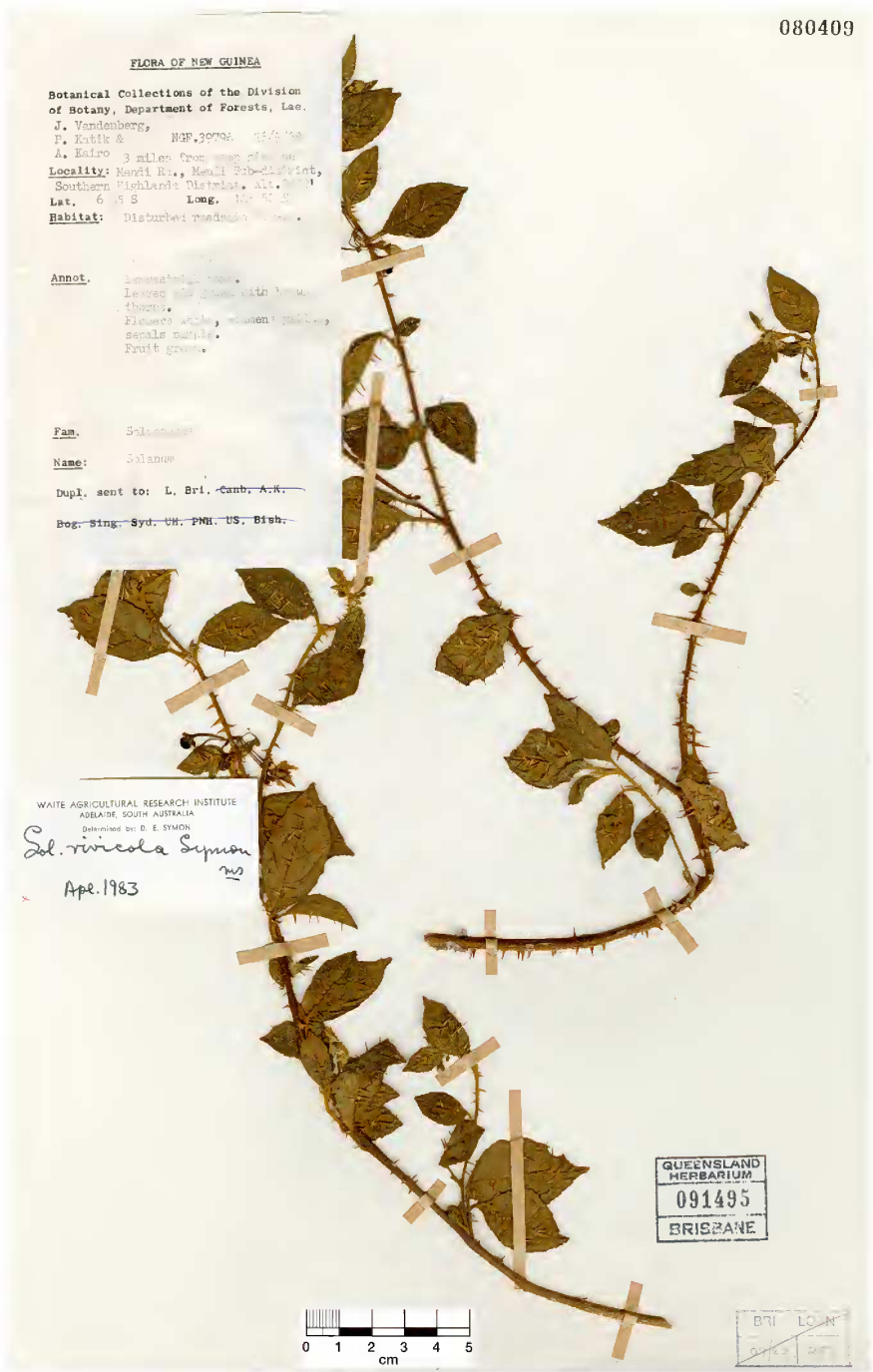


Fig. 23. Holotype of *Solanum scolophyllum* (Vandenberg et al. NGF 39796, BRI).

Phenology: Flowers and immature fruits are recorded for August and September.

Notes: Specimens cited above as *Solanum scolophyllum* were identified by Symon (1985) as *S. rivicola*. *S. scolophyllum* is similar to *S. malignum* (which occurs about 5 km away), but the latter differs by being an erect shrub with branchlet prickles 5–12 mm long, and by having branchlet stellate hairs with broad conical stalks to 0.6 mm long, and longer pedicels.

The collection *Frodin NGF32059* differs from the type by the fewer prickles on the branchlets and both leaf surfaces, the shorter central ray on the stellate hairs of the branchlets and lower leaves, the dense to very dense hairs on the calyx, the fewer flowers per inflorescence, and the flowers with relatively thick pedicels.

The label for the type specimen refers to the plant as a “terrestrial herb”, and it does have all the appearance of a creeping semi-prostrate plant. *Frodin NGF 32059* also has the appearance of a creeping semi-prostrate plant, but the label data include the description “Small tree, height 15 feet”, and “lenticels small, raised, numerous”. I believe these descriptions apply to some other genus of plant, and that there was a mix-up of labels. There are certainly no lenticels on the *Solanum* specimen.

Etymology: The specific epithet is from the Greek *skolos* ‘pointed object, thorn’ and *phyllon* ‘a leaf’. This is given in reference to the many prickles borne on the upper and lower surfaces of the leaves.

29. *Solanum symonianum* W.N.Takeuchi, *Edinburgh J. Bot.* 58: 167 (2001). **Type:** Papua New Guinea. MOROBE PROVINCE: Kamiami Wildlife Management area, Alealer River, W of Sachsen Bay, 15 June 1998, *W. Takeuchi 12027* (holo: L; iso: A, AD, K).

For a description, see Takeuchi (2001).

Additional specimens examined: Papua New Guinea. MOROBE PROVINCE: Oomsis Creek, c. 18 miles [29 km] W of Lae, Mar 1962, *Hartley 10033* (A, BRI); Wagau – Labu track, Mumeng, Mar 2000, *Lovave 69* (A); Garaina area, Saurere track, Wau subdistrict, May 1971, *Stone*

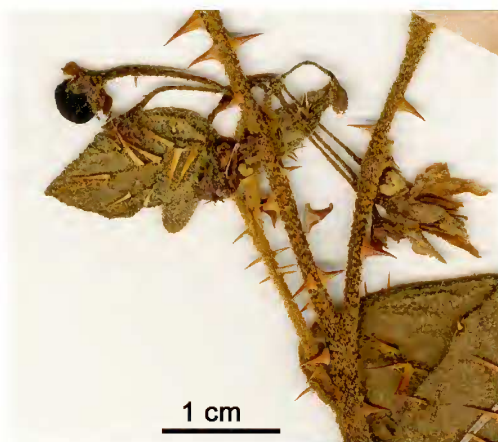


Fig. 24. Inflorescence of *Solanum scolophyllum* (Vandenberg et al. NGF 39796, BRI).

LAES3462 (A, BRI); Mt Kawea, Buso, Lae subdistrict, Apr 1972, *Streimann & Foreman NGF24441* (A, BRI).

Distribution and habitat: *Solanum symonianum* is apparently confined to Morobe province (**Map 2**), where it is known from several sites, at altitudes ranging from 120 to 1100 metres. It occurs in a range of habitats including a secondary forest along a stream, a low montane *Castanopsis* forest, and a ridgetop stunted lowland forest on ultrabasic rocks.

Phenology: Flowers and fruits are recorded from March to May.

Notes: Takeuchi (2001) stated *S. symonianum* was known only from the type, but a number of other collections (cited above) are a very good match for the type. Takeuchi (2001) did not compare *S. symonianum* with *S. anfractum*, but that is clearly its closest relative. It is most readily distinguished from *S. anfractum* by the stellate hairs on the lower leaf surface having 4–8 evenly radiate, slender filamentous lateral rays. He referred to *S. symonianum* as an “unarmed liane”, but other collectors have called it a shrub.

30. *Solanum trichostylum* Merr. & L.M.Perry, *J. Arnold Arb.* 30: 47 (1949). **Type:** Papua New Guinea. CENTRAL PROVINCE: Mt Tafa, September 1933, *L.J. Brass 4934* (holo: A; iso: BRI, NY).

Erect perennial shrub, 1–2 m high. Sympodia bifoliate, geminate. Branchlets brown or rusty; prickles 16–38 per dm, straight, broad-based, 1–2 mm long, 1–2 times longer than wide, with stellate hairs throughout lower part; branchlet stellate hairs dense, 0.2–0.5 mm diameter, stalks 0–0.3 mm long, slender, cylindrical; lateral rays 6–8, porrect; central ray 0.1–0.8 times as long as laterals, not gland-tipped; simple hairs absent. Adult leaves narrowly ovate to ovate or elliptical, entire, 4.5–14.7 cm long, 1.9–5.9 cm wide, 1.9–2.5 times longer than broad; apex acute to acuminate, base cuneate, oblique part 0.5–2.5 mm long, obliqueness index 1–3 percent; petioles 0.7–2.6 cm long, 16–26% length of lamina, prickles present or absent. Upper leaf surface green; prickles absent, or present on midvein only, or on midvein and lateral veins, 0–6, straight, broad-based, 1–4 mm long; stellate hairs distributed throughout, sparse, 0.15–0.4 mm apart, 0.15–0.4 mm across, stalks absent; lateral rays (5–)6–8, porrect; central ray 0.3–3 times as long as laterals, not gland-tipped; simple hairs absent. Lower leaf surface brown to rusty; prickles usually absent or rarely 1 present along midvein; stellate hairs moderately dense, 0.15–0.3 mm apart, 0.35–0.5 mm diameter, stalks 0–0.25 mm long; lateral rays 6–8, porrect; central ray 0.6–2.5 times as long as laterals, not gland-tipped; simple hairs absent. Inflorescence leaf-opposed or supra-axillary, unbranched; common peduncle 0–11 mm long; rachis 1–43 mm long, prickles absent; 6–14-flowered, with all flowers bisexual, 5-merous; pedicels at anthesis 7–16 mm long, 0.5–0.9 mm thick, same thickness throughout, prickles absent. Calyx tube at anthesis 2–2.5 mm long; calyx lobes at anthesis rostrate, 0.5–2.5 mm long; calyx prickles absent; calyx stellae very dense, yellow, 0.25–0.45 mm across, stalks 0–0.2 mm long, lateral rays 6–8, central ray 0.6–2 times as long as laterals, not gland-tipped, simple hairs absent. Corolla purple, 12–14 mm long, shallowly lobed, inner surface with dense stellate hairs; anthers 4.3–5.8 mm long; filaments 1.2–2 mm long; ovary with sparse tiny glandular hairs or with dense stellate hairs; functional style 7–8 mm long, protruding between anthers, with sparse

tiny glandular hairs towards base, or with dense stellate hairs except on distal 2–3 mm. Fruiting calyx lobes less than half length of mature fruit, prickles absent; mature fruits 1–7 per inflorescence, globose, *c.* 14 mm diameter, yellow (*Brass 4934*) at maturity; pedicels 21–27 mm long, thicker towards apex, 0.8–1 mm thick at midpoint. Seeds not seen.

Additional specimens examined: Papua New Guinea. MOROBE PROVINCE: Road above Edie Creek (from Bulolo), subdistrict Wau, May 1977, *Kairo & Symon 10636* (AD, BRI, CANB, L); Above Wau on Edie Creek Road, Jun 1954, *Womersley & van Royen 5909* (BRI, L). CENTRAL PROVINCE: Murray Pass, Wharton Range, Jul 1933, *Brass 4539* (BRI, L, NY); Mt Tafa, Sep 1933, *Brass 4934* (A, BRI); W slope, Wharton Range, Avios, Jan 1965, *van Royen NGF30154* (A, BRI, CANB, L).

Distribution and habitat: *Solanum trichostylum* occurs in the Mt Tafa – Wharton Range area of Central province, and there is an outlier near Edie Creek in Morobe province (**Map 1**). Recorded altitudes range from 1900 to 2650 metres. It occurs on roadside clearings in forest, secondary regrowth or fire-damaged forest borders.

Phenology: Flowers are recorded for January, May, June, July and September; fruits in May, June, July and September.

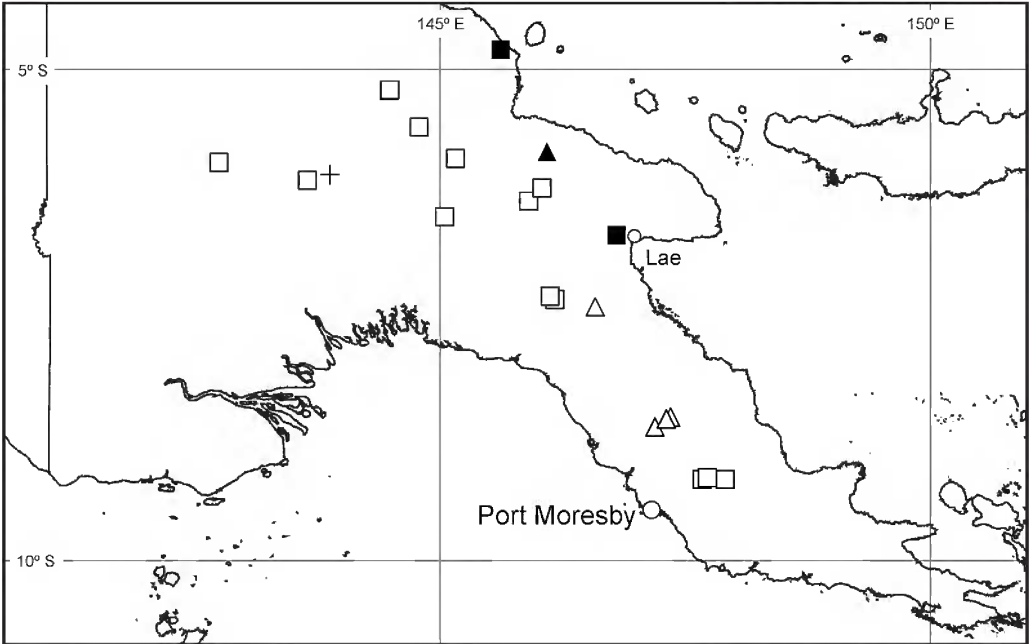
Notes: Specimens from the Edie Creek area are not typical as the style and ovary have glandular hairs only, lacking the stellate hairs that are so prominent in the type, and the central ray of the stellate hairs on the leaves is 2–3 times longer than lateral rays (0.3–1.1 times for the typical form).

Acknowledgements

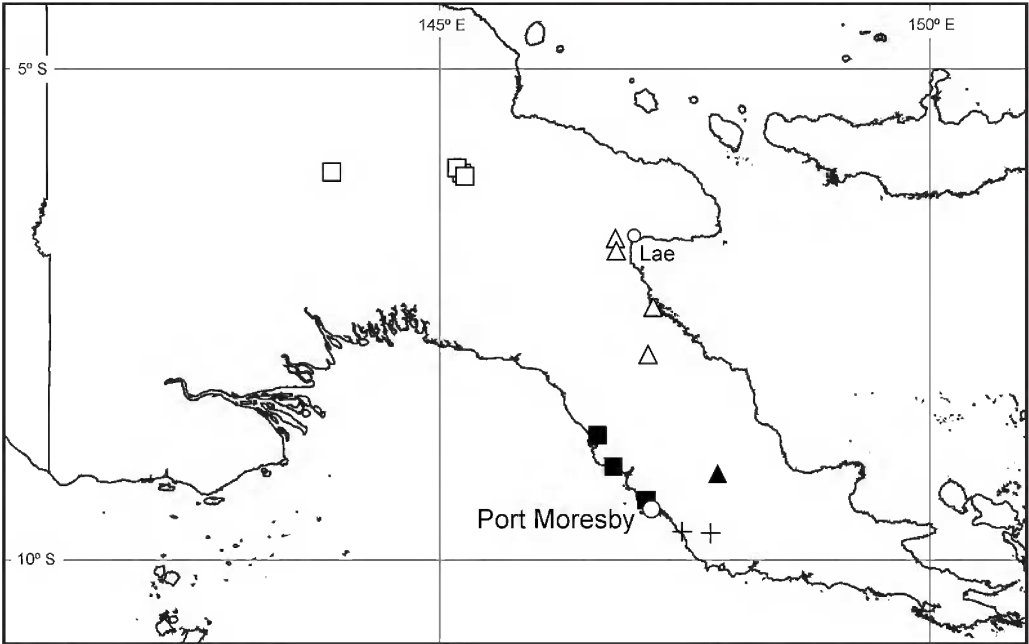
I thank the Directors of A, AD and CANB for sending specimens on loan. I am grateful to Dr Sandra Knapp (BM) for her critical examination of the holotype of *S. turraeifolium*; to Will Smith (BRI) for the specimen images and the editing of the distribution maps.

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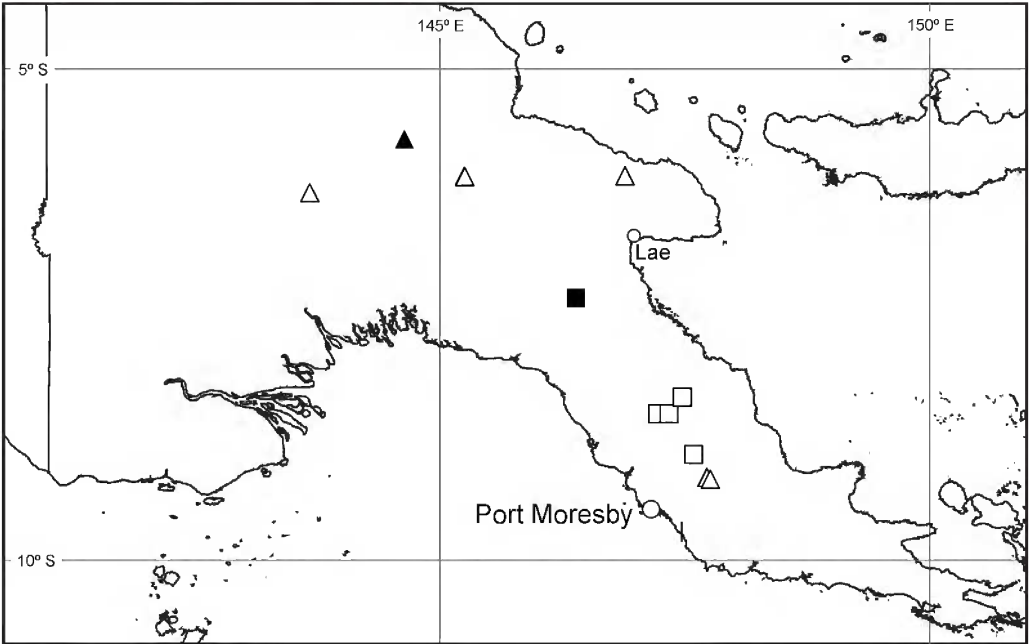
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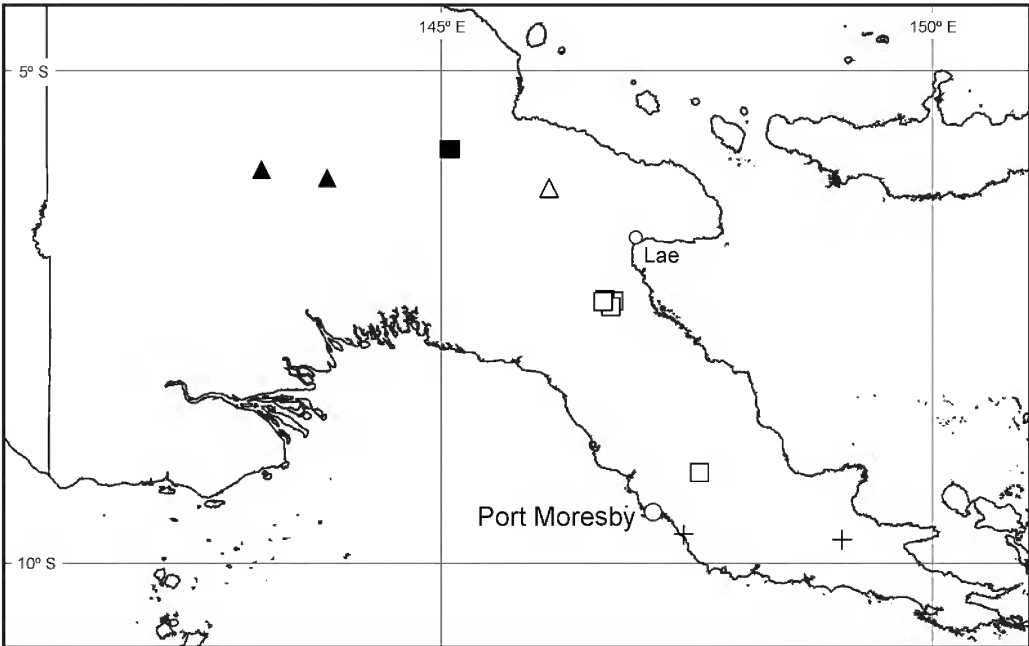
Map 1. Distribution of *Solanum* species in New Guinea: *S. anfractum* □, *S. malignum* +, *S. oomsis* ■, *S. ortivum* ▲, *S. trichostylum* △.



Map 2. Distribution of *Solanum* species in New Guinea: *S. discolor* ■, *S. expedunculatum* □, *S. fervens* +, *S. petilum* ▲, *S. symonianum* △.



Map 3. Distribution of *Solanum* species in New Guinea: *S. arachnoides* ■, *S. banzicum* ▲, *S. invictum* □, *S. papuanum* △.



Map 4. Distribution of *Solanum* species in New Guinea: *S. exemptum* +, *S. phoberum* ■, *S. pluriflorum* △, *S. rivicola* □, *S. scolophyllum* ▲.